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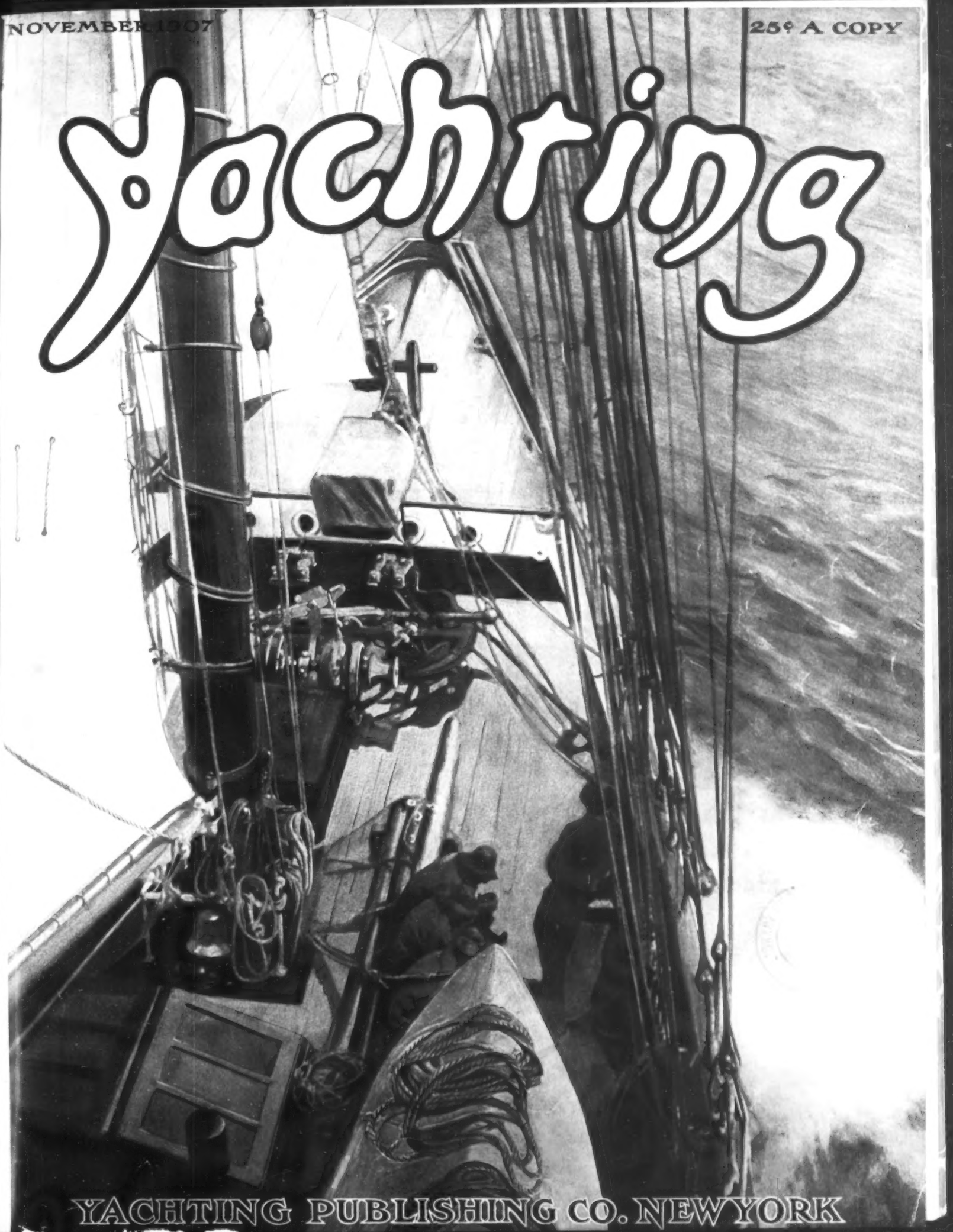

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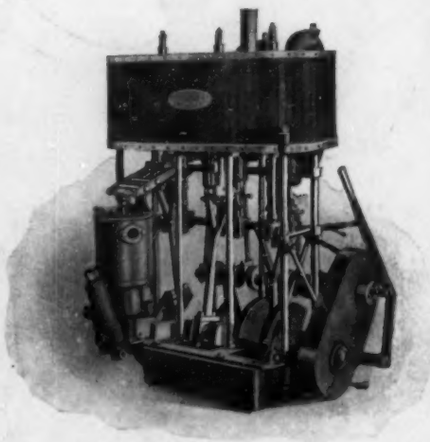

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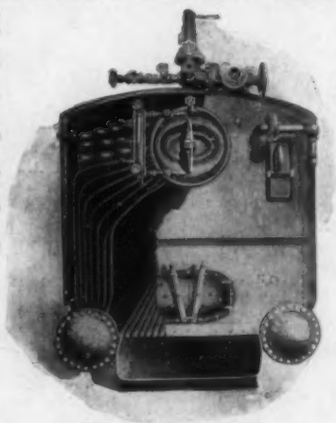

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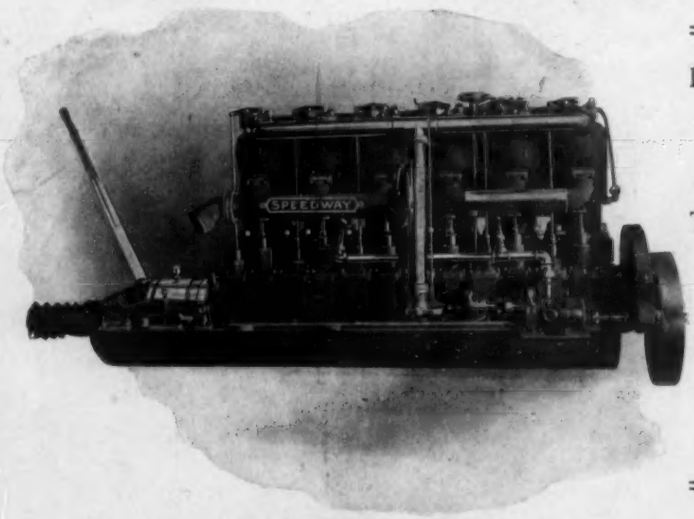

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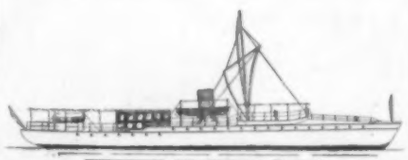

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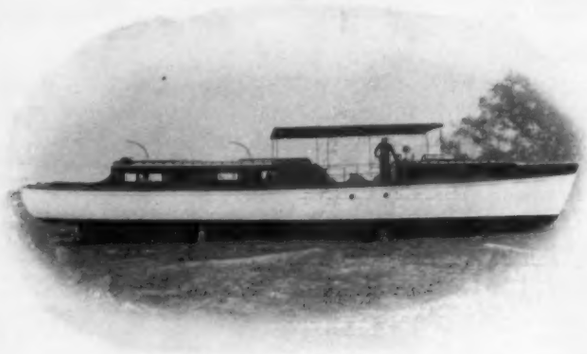

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CHARLES SCRIBNER'S SONS

In the Captain's Cabin

AS WE write this, a letter reaches us from a resident of St. Petersburg, Russia, subscribing to YACHTING commencing with the first number. Such things are very interesting, indicating as they do the universality of YACHTING's influence and of the way in which the magazine is being received in all quarters of the globe. This letter led us to look over our subscription records and we find that we have subscribers in

China	Denmark	England
Finland	Germany	Holland
Italy	Norway	Spain
Switzerland	Turkey	British Honduras
India	Australia	Gibralter
Hawaii	Argentine Republic	British Guiana
Cuba	Canal Zone	Mexico
Alaska	Canada	Porto Rico

It is very gratifying to us that YACHTING has in so short a time become so widely known and looked to as an authority on the sport in America.

Several days ago a member of the San Sebastian Yacht Club of Spain came into our office and subscribed for his club. He told us that King Alfonso upon seeing a copy of YACHTING recently expressed great interest in it and exclaimed "This is so excellent a magazine that we must have it for our club."

Our foreign subscribers for the most part, we are glad to say, are enthusiastic over the magazine and are anxious to get it. One subscriber in Buenos Ayres closes his letter with "Kindly see that copies are sent promptly when issued and always by the quickest route." This reminds us of a subscriber in Arizona, who, when one of the earlier numbers was delayed, wrote "For Heaven's sake send me my copy promptly, it is the only breath of salt air I ever get out here."

YACHTING AS AN ENCYCLOPAEDIA

In a certain small yacht club in a western city, a representative of YACHTING found the walls of the assembly room lined with tastefully framed double page half tone reproductions taken from YACHTING. The effect was striking.

Upon being questioned whether it was merely the illustrative features of YACHTING that appealed to this club, the secretary drew from a desk an immense scrap book in which under such headings as Western Yachting, Far Western Yachting, Practical Information, Historical Articles and the like practically the entire contents of this publication since its initial number was pasted.

In discussing this system of preserving data connected with the sport this gentleman spoke of the breadth of YACHTING as the feature concerning it which had appealed to him and his associates more than anything else.

"For," he said, "as you see from the excerpts taken from YACHTING alone we have information concerning current events, race conditions and the like from about every yachting center in this country, to say nothing of your foreign news. I don't say that we have had to look to YACHTING solely for our data but I do say that in the making of this scrap book we would have found the task utterly impossible so far as anything adequate and valuable was concerned had it not been for your magazine."

Another yachtsman well known on Lake Michigan spoke of the pleasure he had as a subscriber to this magazine, and his words which we quote may be utilized as an argument in favor of subscription as against the practise of news-stand buying especially in cases where the buyer keeps a file of the magazine, or who is interested in following the sport through YACHTING.

"I had never subscribed to a magazine of any sort," he said, "until I took YACHTING on your special six month's trial offer. The first number had interested me and upon calling at several news-stands for the second issue, and hearing that it had either been sold out or was not carried I made up my mind that if the magazine was worth seeing, it was worth seeing regularly. And I knew that the sure way of seeing it regularly was to subscribe since failure to get it at the stand may occur in so many ways.

"So I subscribed and when the trial subscription ran out I renewed for a year. I find it at my home month after month, always interesting and not infrequently valuable from my own particular viewpoint.

"I know yachtsmen as a rule are not of the subscribing sort, I was not myself, but now with my eight months experience I recommend it to everyone who loves the sea or a boat, to everyone who would desire a library table beautified with a necessary magazine."

A suggestion might be in order here. If you are not a subscriber, why not begin now. A blank is appended at the foot of the page for your convenience.

A SUBSCRIBER'S OPPORTUNITY

Why not have your back numbers in convenient form for reference as did the yacht club secretary mentioned above?

In order that you may have them so we will agree on receipt of $4.00 to enter your subscription to YACHTING for a year and send you Volume I bound. These would cost if purchased in the regular way, $6.10.

THE DECEMBER NUMBER

In the making of a magazine as profusely illustrated as YACHTING the tendency might well be to subordinate the text, relying upon the sheer beauty and clever arrangement of pictures to offset mediocre reading matter. It may be true that embellishments of this sort cover a multitude of sins, but the constant aim of this magazine has been to appeal to the mind as well as to the eye.

In this regard we might suggest the October and November YACHTING as the height of our achievement thus far. And the December issue will mark another forward step. One feature especially will attract instant and widespread attention. It has to do with motor boats in all its branches, an epoch making achievement such as no other magazine devoted to yachting has ever attempted. For very many reasons it will be a timely feature, and in all its ramifications will be something that no motor boat owner or mere looker on can afford to miss.

There will be a wonderfully interesting article having to do with the ships of the sea fallen on evil days by a well known writer and dramatist, Ernest F. Boddington, and a character sketch of the famous English designer Fife, drawn in a natural setting, the cockpit of a racing sloop. The racing of the season on Gravesend Bay will interest all local yachtsmen, and there will also be an article on the formation of one design classes which will impart a world of valuable information to every yacht club member in the country. The Farralon race on the Pacific coast, a story of a yacht race in the Middle West, the Jamestown Regatta and other attractive articles, essays and the like will round out an unusual number. The illustrations to revert to our opening paragraph will compare favorably with previous numbers; in fact it is our opinion that in several ways the December YACHTING will transcend all our previous artistic endeavors.

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Write for our illustrated booklet giving full particulars of the above cruises and also of the cruises to the **Orient**, the **Mediterranean**, **Egypt**, **Holy Land**, the **Adriatic**, **West Indies**, **Venezuela** and **Panama Canal**.

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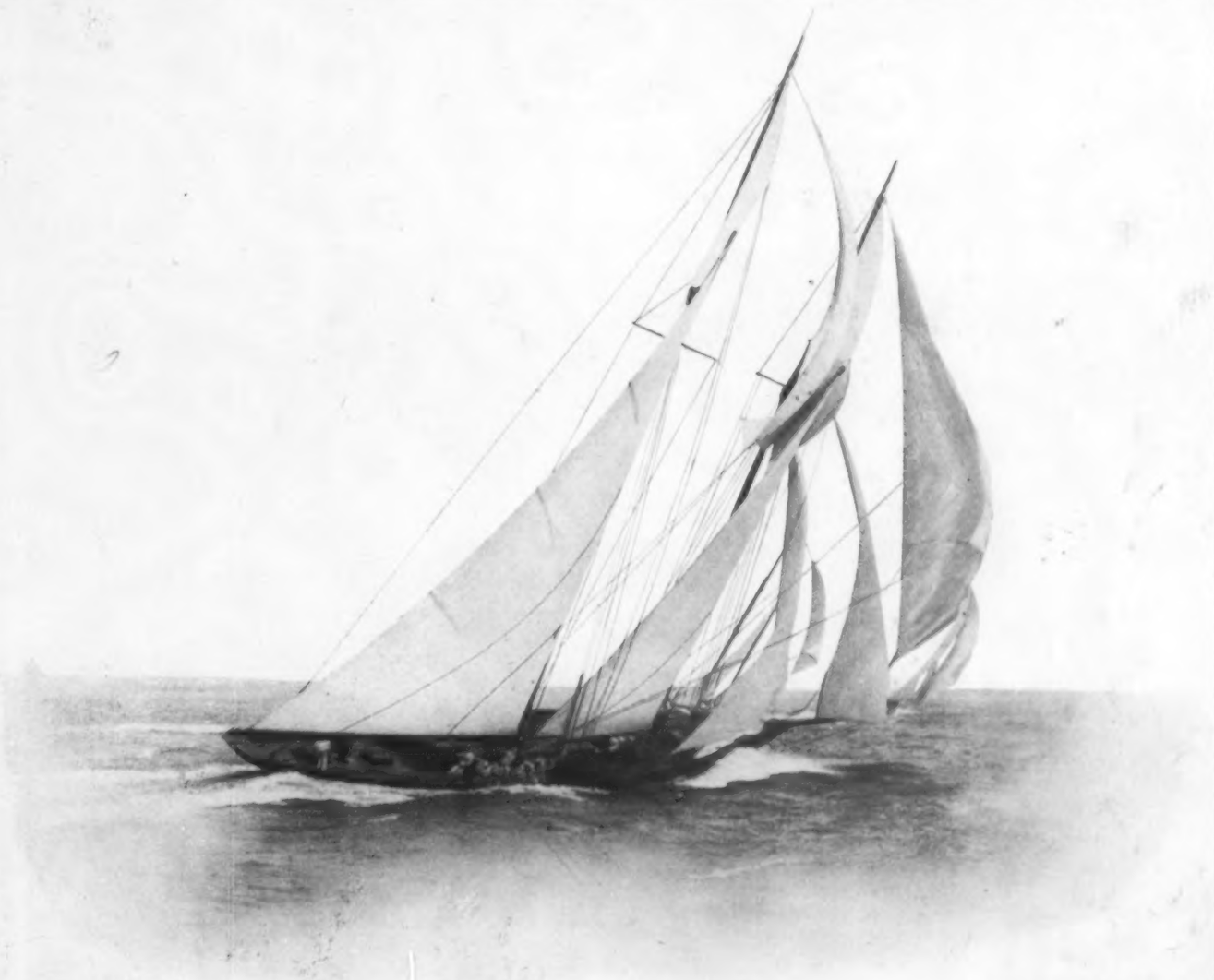

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DEN II, WINNER IN THE MILE SPEED TRIALS—HER AVERAGE SPEED IN THE THREE TRIALS WITH AND AGAINST THE TIDE WAS 25.622 KNOTS, OR 29.504 MILES PER HOUR—AT FULL CLIP SHE RUNS WITH HER BOW WELL OUT OF WATER IN THE FASHION OF A HYDROPLANE. HER LENGTH IS 30 FEET, ENGINE 74 H.P.

YACHTING

VOLUME II.—NUMBER 5

November, 1907

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XPDNC IN THE RACE FOR THE NATIONAL CHAMPIONSHIP AND SPARROW FOR THE INTERSTATE TROPHY, FINISHING TOGETHER.

National Motor Boat Carnival on the Hudson River

A WEEK OF GOOD SPORT IN WHICH THOSE WHO HAVE MAINTAINED THAT THERE IS NO REAL SPORT IN MOTOR BOAT RACING, THAT IT LACKS THE THRILL AND HAS NO PICTURESQUE ELEMENTS, WOULD HAVE REALIZED THE FALSITY OF THEIR INTENTIONS—THERE WERE, IN POINT OF FACT, RACES THAT MADE THE BREATH COME QUICK AND THERE WERE SCENES THAT WOULD HAVE APPEALED TO ANY MAN, WHETHER HE KNEW A POWER CRAFT FROM A BATTLESHIP OR NOT—RACES OF DEN II, SKEDADDLE, DIXIE, XPDNC AND OTHER "FLIGHTY" BOATS

By ROBERT MEDILL McBRIDE

Photographs by Edwin Levick and Brown Brothers

AFTER a season of disappointing dullness in motor boat racing, relieved only by the international contest in England, the second annual regatta of the Motor Boat Club of America was held on the Hudson River during the week of September 25th, with an entry list which exceeded by far that of a year ago. This was especially the case in the cruising classes, a pleasing contrast to the last regatta when cruising men seemed more content to watch the events than to participate in them.

The results of the week's racing generally showed an improvement in the new rating rules over those which had heretofore obtained and those in use by other associations, although they will need revision before final adoption in permanent form. In the speed classes, through development by greater usage, the regulations adopted this year proved, by practical test during the races, to be almost entirely satisfactory. So nearly perfect are they that when tried, there was almost no variation between the computed rating and the speed actually developed. Many power yachtsmen, however, hope that eventually we shall adopt the English rule of rating which restricts the hull length only, im-

IRENE, WINNER OF THE INTERNATIONAL WORLD'S CHAMPIONSHIP FORMERLY HELD BY DIXIE WHICH WAS UNFORTUNATE IN BREAKING DOWN IN THE DEFENDING RACES. IRENE IS 60.10 FEET W. L. AND IS ENGINED BY A 200 H. P. MOTOR.

SKEDADDLE, THE STAR OF THE REGATTA. SHE CARRIED OFF THE TROPHY IN EACH CLASS SHE ENTERED AND WAS BEATEN ONLY IN THE MILE SPEED TRIALS. HER TITLES ARE NATIONAL CHAMPION, AMERICAN FREE-FOR-ALL CHAMPION AND LONG DISTANCE CHAMPION.

posing no restrictions whatever on beam, displacement or horsepower.

The following formula adopted by the Motor Boat Club of America is the one under which the boats were rated.

$$V=C^3\sqrt{\frac{P\times\sqrt{L}}{D}}$$

In which V is the speed in nautical miles per hour; C is a constant which for racers is 11 and for cruisers 9.7; P is the power determined by the horsepower formula; L is the length of the water line in running condition; D is the displacement in cubic feet.

FORMULA FOR CALCULATING HORSEPOWER.

The horsepower for 4-cycle motors having a stroke of six inches or over,

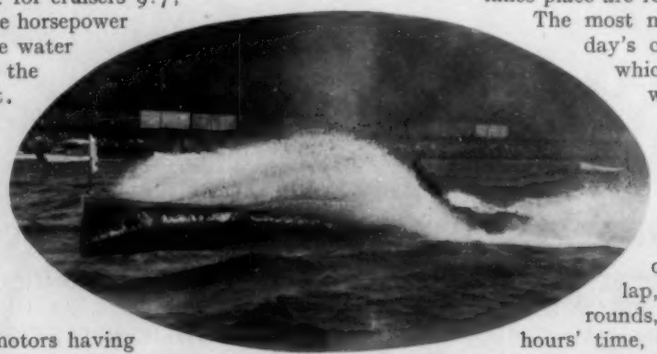
$$P=\frac{A\times N}{2}$$

The horsepower for 4-cycle motors having less than six-inch strokes,

$$P=\frac{A\times N\times S}{12}$$

The horsepower for 2-cycle motors having a stroke of six inches or more,

$$P=\frac{A\times N}{1.65}$$



DIXIE SPLITTING A WAVE JUST BEFORE BREAKING DOWN. AT THIS TIME SHE WAS MAKING BETTER THAN 28 MILES AN HOUR.

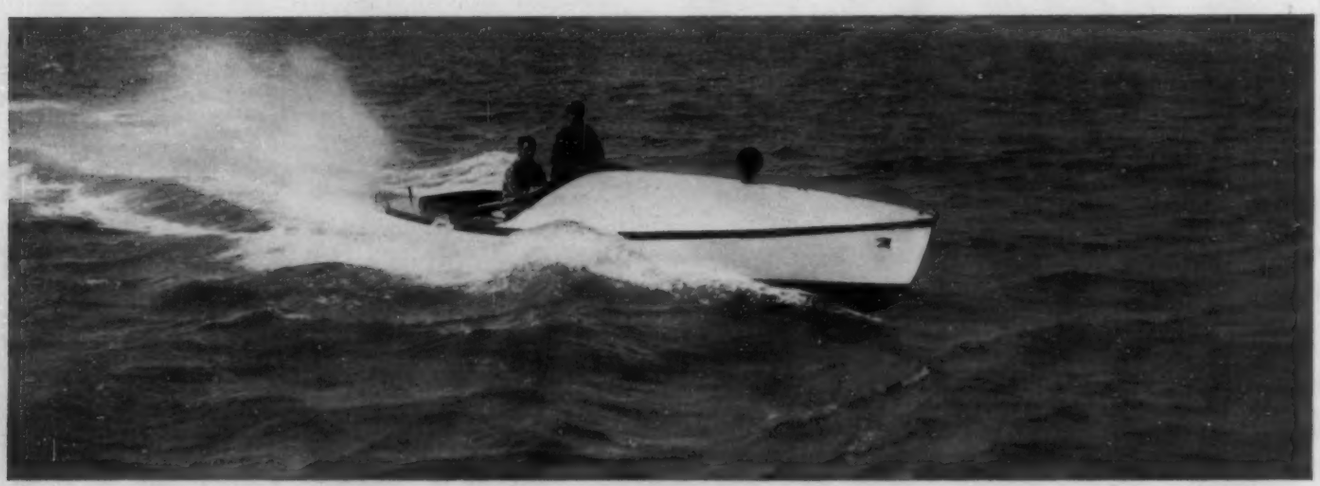
The horsepower for 2-cycle motors under six-inch stroke,

$$P=\frac{A\times N\times S}{10.2}$$

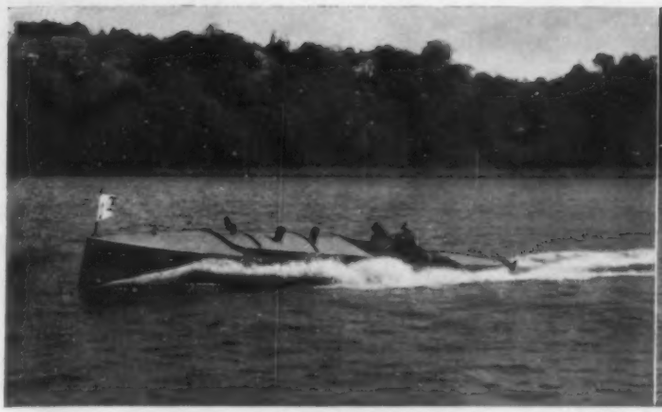
In these formulas P equals horsepower; A equals the area of one cylinder in square inches; N equals the number of cylinders; S equals the stroke in inches. In these formulas the area of working cylinders only, or cylinders in which an explosion takes place are referred to.

The most noteworthy element in the first day's contest, the Reliability Trials, in which eight boats came to the line, was, that under severely adverse conditions of driving rain and fog which at times cut off all view of the shore a few hundred feet away, not one of the contestants was eliminated through engine troubles in the six hours of constant running. On the last lap, however, after making eight rounds, which consumed more than four hours' time, the valiant Sparrow, owned by Charles J. Swain of Philadelphia, the only entrant not finishing, ran short of gasolene and was thus compelled to withdraw.

This is a remarkable showing as four of the entrants were speed boats pure and simple, the others being in the cruising classes, boats into whose design the element of seaworthiness was not to any particular degree taken into consideration. During the latter part of the trial especially rough water and driving rain put every boat to the most



WHITE FOX II WITH EVERYTHING "HOOKED UP."



DIXIE, THE BRITISH INTERNATIONAL CUP WINNER, DASHING ALONG LIKE A RACE HORSE. GREAT THINGS WERE EXPECTED OF HER, BUT AS A RESULT, PRIMARILY OF AN ACCIDENT AT JAMESTOWN SHE BROKE DOWN IN EACH RACE AND FAILED TO CARRY OFF ANY PRIZES.

DURNO II, CONTESTANT IN THE INTERSTATE CHAMPIONSHIP, RELIABILITY TRIALS AND LONG DISTANCE CONTEST, DIGGING ALONG BELOW HER PLIMSOLL MARK, SO TO SPEAK. SHE WAS ONE OF THE SMALLER BOATS IN THE REGATTA, MEASURING BUT 25½ FEET OVER ALL.

exacting test. Even at the start the weather conditions were so severe that eight of the sixteen boats entered, withdrew before the start.

The race was over a ten-mile triangular course, and a time limit of six hours was set. Speed alone was not to determine the victor but regularity of speed, reliability or freedom from stoppage, actual speed in comparison with theoretical speed of engine, consumption of oil and fuel, reversibility, ease of control and such tests of real dependability so desirable in a motor boat. It may be interesting to give the regulations governing this contest and the number of points for each qualification.

1.—RELIABILITY IN OPERATION, 50 points, with 5 points deduction for every stop of the motor.

2.—REGULARITY in covering the course or uniformity of speed throughout the test, 50 points, based upon the performance of the boat making the least variation in time.

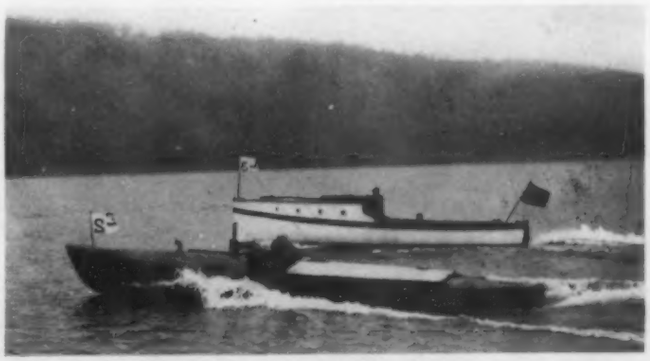
3.—FUEL ECONOMY, 50 points, based upon fuel consumed per horsepower per hour. Horsepower being figured as per formula. Points being calculated from boat making the best performance in fuel consumption.

4.—LUBRICATING ECONOMY, 25 points, based upon lubricating oil consumed. Points being calculated from the boat making the least consumption.

5.—SPEED, 50 points, each boat to be awarded such percentage of 50 points as her actual speed is of her theoretical speed.

6.—REVERSIBILITY, EASE OF CONTROL, STARTING, 25 points each, to be based upon the boat making the best performance in these qualities. Starting should be from rest with cylinders empty of gases. These tests to be made separate from the six-hour test.

7.—FINAL CONDITION. The boats upon completing the reliability test shall be surrendered by the crew to the custody of the Committee for inspection. This inspection will take account of the condition of the hull, motor installation and generally the satisfactory condition of the outfit as a whole, credit for this to be awarded 50 points, or any part of this number of points at the discretion of the Committee.

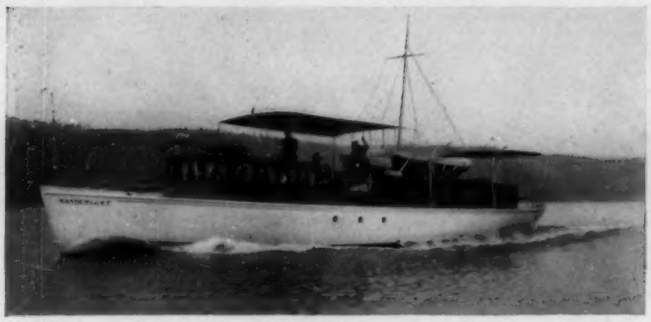


RACER AND CRUISER. ORIOLE IN THE INTERSTATE CLASS MAKING RINGS AROUND CLASS L CRUISER JULIET.

SPARROW, WINNER OF THE INTERSTATE CHAMPIONSHIP. SHE DID NOT FARE SO WELL AS LAST YEAR, WHEN SHE CARRIED OFF THREE CUPS.

On Tuesday afternoon was run the race for the American Free For-All-Championship. The conditions were even more treacherous than of the preceding day, although the pessimists then had thought it could not be worse. The wind was blowing at a 25 or 30-mile clip which whipped up a bad sea and made conditions that were really hazardous for the low and lean time of speed boat entered. The course was the same one of ten miles to be run over three times. There were four starters: James H. Hoadley's 74-horsepower Den II, H. N. Baruch's 190-horsepower Skedaddle, Commodore E. J. Schroeder's 150-horsepower Dixie (which by the way was handled by Captain S. B. Pierce and Al Rapoon who brought her through a winner in the Southampton races) and J. F. Anderson's 200-horsepower Irene.

With this fine set of entries an unusually exciting contest was expected, but misfortune seemed to follow the whole event. Dixie dropped out in the first round because of engine troubles, the remaining



WANDERLUST, ONE OF THE CONTESTANTS IN THE MOTOR YACHT CHAMPIONSHIP SERIES. SHE IS THE PROBABLE WINNER ALTHOUGH A DEFINITE DECISION HAS NOT YET BEEN REACHED OWING TO LACK OF MEASUREMENTS.

AQUILA SHOWING THE WAY TO SPEEDWAY, JR., AND IDLER IN THE FINAL CLASS L RACE. IDLER WON THE SERIES WITH 21 POINTS TO HER CREDIT. SPEEDWAY, JR., TOOK SECOND PRIZE WITH 16 POINTS.

boats were nip and tuck over the first lap of ten miles when a furious rain squall swept down the course. Those who were watching Skedaddle saw her suddenly burst into flames. The heavy seas created by the fury of the storm had choked the exhaust, causing the engine to back fire, as a result of which the oil and gasolene in the drip pan became ignited. After nerve-racking work on the part of the crew, two of whom were obliged to work frantically at the pumps to keep afloat, the fire was extinguished by the aid of fire extinguishers, Skedaddle continuing over the course. In the meantime Den II, which is a much smaller and less seaworthy craft was seen to be in trouble, (some driftwood had fouled her propeller) and Joseph H. Hoadley put out in his motor yacht Alabama and towed her ashore. It was then between Skedaddle and Irene, but this last boat after making a game fight with only one cylinder working limped to a finish of the second round and retired. This left Skedaddle to finish the course alone which she did, averaging twenty-eight statute miles per hour in the last lap.

The first leg for the National Championship was run on Wednesday with C. L. Seabury's Speedway, Jacob Siegel's 69-horsepower Xpdnc and Skedaddle as the starters. Xpdnc was the winner, finishing ten minutes ahead of Skedaddle and won on corrected time by nearly five minutes. Skedaddle came out the victor on the two following days and she therefore retained the title of National Champion, which she has held for the past year.

The races for the International World's Championship were run on Wednesday, Thursday and Friday. In the first day's racing Den II scored a hollow victory over Dixie, the only other craft to compete. In the first round Dixie had carburetor troubles, and was obliged to withdraw leaving Den II a walkover. The Hoadley boat did not relax her speed, however, and finished in one hour fifteen minutes and fifty-two seconds, thus averaging 23.6 knots or nearly 27.5 miles per hour. The following day Den II did not start and Dixie being put out of the running by a cracked cylinder, J. F. Anderson's 200-horsepower Irene secured a runaway. With one race each to their credit, Den II and Irene had an exciting race on Friday, the last of the series for the International Championship. Irene was the victor, winning by nearly four minutes on corrected time. The weather conditions were so ideal for speed on Friday morning that it was decided to run off the one-mile championship which had developed into a farce on Tuesday through mis-timing by the timers. Den II and Skedaddle were the only starters, and their start was a flying one. Den II won in handy style. She averaged 25.626 knots, equal to 29.504 statute miles. Skedaddle did 23.334 knots, equivalent to 26.10 miles.

SKEDADDLE'S 190 H. P. ENGINE.

CLUB HOUSE AND JUDGES' STAND, FOOT OF 108th STREET, NEW YORK, OFF WHICH THE STARTS WERE MADE.

There was a comparatively large list of entries for the Interstate Championship, the first leg of which was run on Wednesday. Sparrow was successful in showing her heels to the field in all three legs which were run on successive days and Artful took second place.

In the Class L event were seven entries, Idler winning and being accorded twenty-one points. The Motor Yacht Championship series had four entrants while the cabin launch championship series had three. Neither of the last two events had been decided on going to press, but it is believed that E. J. Steiner's Wanderlust won the motor yacht series.

Tables referring to these events will be found on pages 298 and 300.

The most exciting contest of the week and one of the most remarkable ever run from closeness of finish was the long distance race to Poughkeepsie on Saturday, in which the old rivals Den II and Skedaddle participated. Over a course of 116.3 miles from off 108th Street, N. Y., to Poughkeepsie and return they finished 59

(Continued on page 296.)

Put-In-Bay Regatta

ONE OF THE IMPORTANT EVENTS OF YACHTING ON THE GREAT LAKES—FIVE SUCCESSIVE DAYS OF GREAT RACING—EVERY EVENT BUT TWO WAS FINISHED INSIDE OF THE TIME LIMIT WHICH SPEAKS VOLUMES FOR THE CONDITIONS THAT OBTAINED—A WEEK DEVOTED TO RACING MEN

By GEORGE R. PULFORD

Photographs by A. L. Kraffert

LOOKING at it from every angle and focusing the result, the thirteenth annual regatta of the Inter-Lake Yachting Association at Put-In-Bay, Lake Erie, was the greatest success the organization can boast of.

With five successive days of racing the regatta committee, composed entirely of Lakewood Club yachtsmen from Cleveland, is to be congratulated upon the fact that every race was completed by Friday. But two events had to be resailed—the 18- and 16-foot classes failed to finish inside their respective time limit on Friday morning, but succeeded in doing so in the afternoon.

Some criticism was heard from the veranda sailors on the lack of entertainment, but the men who attended for the racing were satisfied. The stags on Monday and Friday evenings and the annual ball on Thursday night were well attended and pleased everyone.

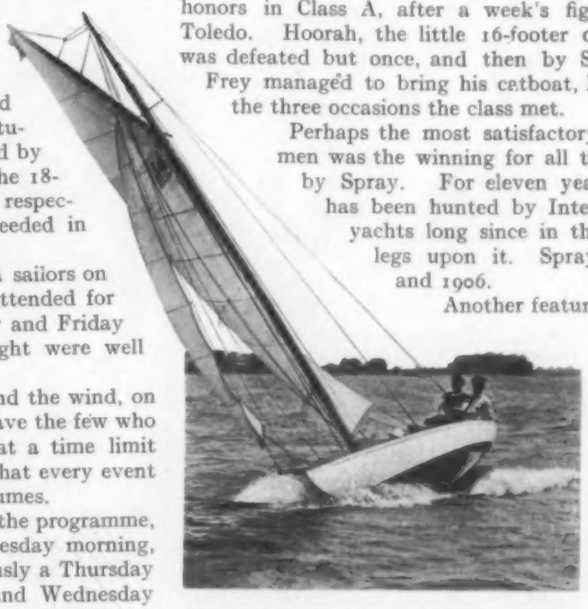
The week brought forth some good racing and the wind, on the whole, was strong enough to suit everyone save the few who always cry for a two-reef blow. The fact that a time limit was placed on the races, for the first time, and that every event but two was finished inside the limit speaks volumes.

The race committee added an extra event to the programme, beginning the racing on Monday instead of Tuesday morning, as in the past. The usual squadron sail, previously a Thursday afternoon show event, was done away with and Wednesday afternoon was given to a power boat race.

Five classes were ready to compete. First came the 21-footers, which are being forced into second place by the fast 18-footers; then the yachts which sailed under the universal rating, known as Class A, containing everything from Wrinkle, an 18-foot centerboarder, to Ethel, a 45-foot cruiser.

The 18-foot restricted class was a Cleveland race, all the entries being from the Lakewood Club. The 16-foot class was representative, and the Catboat class was all Toledo.

The result of the entire week which was estimated on the percentage plan, was a clean sweep for Spray, sailed for the first time by her new owner, Commodore Price of Chicago, in the 21-foot class. Bonitwo won three races in the 18-foot class; Invader, the Royal Canadian entry, sailed by her designer, Captain Fernside, captured honors in Class A, after a week's fighting with Enright of Toledo. Hoorah, the little 16-footer of the Lakewood Club, was defeated but once, and then by Sella II in light winds. Frey managed to bring his catboat, Lucile, home first upon the three occasions the class met.



HOORAH. SHE WON THE PRIZE IN THE 16-FOOT RESTRICTED CLASS RACE.

Perhaps the most satisfactory event to the yachtsmen was the winning for all time of the Victory Cup by Spray. For eleven years this famous trophy has been hunted by Inter-Lake yachtsmen and yachts long since in the bone yard have had legs upon it. Spray had won it in 1905 and 1906.

Another feature favorably commented upon was the return of the Association to the cash prize system, after two seasons of sailing for medallions. About $600 was divided among skippers in addition to several hundred dollars worth of merchandise and flags. Last year and in 1905, the first, second and third boats were awarded medallions instead of cash and to the owner not backed with a large bank roll, this did not appeal. As a majority of the Inter-Lakers are men who work for a livelihood, the $50 or $60 looks good.

WITH SHEETS BROAD OFF. CATBOATS IN PUT-IN-BAY REGATTA.

Monday's Races.—Spray, Bonitwo, Hoorah and Mildred S. were winners in their classes and Frey captured first in the catboat race with Lucile.

More perfect yachting weather could not have been asked. The wholesail breeze from the south kicked up a little sea and as Spray stood out her skipper put in a balance reef which example was followed by the other 21-footers. The 18-footers carried full canvas as did the 16's before the race was finished.

Promptly at 8.30 the 21-footers were sent away over the first leg of the nine-mile triangle (N. N. W.) with spinnakers to port. The slide gave Spray an advantage and she led to the first stake. The second leg, (S. W. ¾ S.) was a splendid thresh to windward, with a long leg to port and a short hitch to starboard to fetch the flag. The wind was puffy and the sea high and Spray gained surely but slowly, turning the second mark with a winning lead which could not be overcome.

Bonitwo and Fannette fought it out in the 18-foot class. The former was worsted at the start, but overhauled Fannette and turned the first mark on even terms. The windward work

found the class bunched. Bonitwo, with her new canvas, could not point with Fannette or Fudge, but outfooted them and was first around the second stake and won handily.

The Class A entries, eight all told, furnished a surprise. Invader and Elsie ran away from the class on the first leg, but in the windward work Mildred S. behaved splendidly and gained enough to get first place on corrected time.

The race of the day was offered by 16-footers, Hoorah and Gamble. Down the wind Sella II walked away from her rivals, but was lost on the wind. Hoorah and Gamble rounded together and fought every foot to the finish, Hoorah winning by seventeen seconds.

Tuesday's Race.—It was windward and leeward, eight miles and back, and the race was a drift both ways. Spray, Invader, Bonitwo and Sella II came home first in their classes. The 18-footers had a close call, Bonitwo crossing the line with just 41 seconds to spare.

Spray was last away in the 21-foot class, but she is a notorious drifter and was not long assuming a lead, winning by about seven minutes. The real fight of Tuesday was in the 18-foot class again. While the breeze held they hung together and at times a blanket would have covered them, but when the wind petered out, Bonitwo seemed to move along while the others were becalmed and at the windward mark Bonitwo had a safe lead, which she held on the drift home.

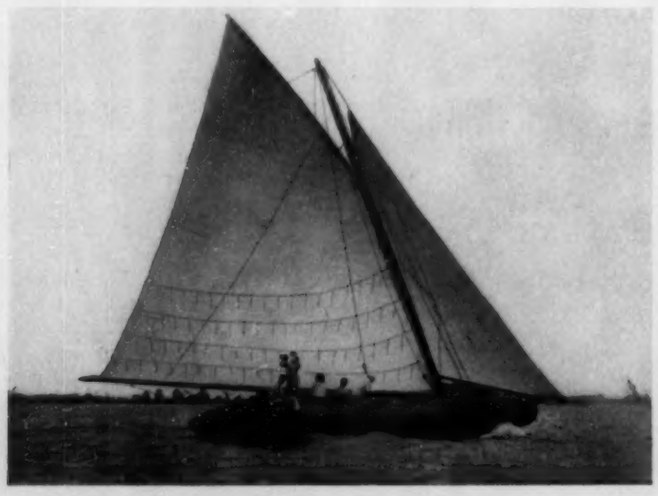
In the 16-foot class Sella II was invincible. She simply romped away and won handily. This was really a piece of fortune, for Commodore Frank Frey, who sailed the Luedtke craft, went wind hunting on the leg home and found a shift which never reached the others.

The light weather and long windward leg suited Invader and the ex-Canada's cup hunter slipped along like a wraith, shaking Class A in a hurry and winning by eight minutes over Enright; the latter's towering top canvas gave her an advantage which enabled her to finish second.

Wednesday's Racing.—The races were over the triangle, as on Monday, and the wind which was fresh and steady on the first and third legs, was light and puffy on the second, outside Rattlesnake Island.

Spray, Malillian, Invader, Hoorah and Lucile were winners. The victory of Malillian, oldest of the 18-footers, was a big surprise.

Cleveland gave Spray a grand race, the first by the way the champion has had, while Invader demonstrated her speed by sailing the course in the fastest time of the day.



INVADER, A CLASS A BOAT.

SPRAY, WINNER OF THE 21-FOOT RESTRICTED CLASS.

The 18-footers, with the exception of Malillian, had light winds over half the course. Zickes, skipper of the latter boat, showed splendid judgment in his weather work on the second leg and held a fair sailing breeze while the others were baffled by the choppy sea and light breeze.

Hoorah won the 16-foot race on the second leg, having led Sella II to the first stake boat and on the wind having everything her own way. Gamble found the choppy sea too much and finished a poor third.

The manner in which Invader went through the fleet was marvelous. The heavy sea on the second leg seemed to just suit the long craft and she beat Spray by one minute and twenty-four seconds, which for a veteran of her age, was wonderful sailing.

Frey won the second catboat race with Lucile, from his old rival, Grasser, in Holy Stone, after a hot battle over the entire course. He gained the advantage on the windward leg and held it to the end.

In the afternoon the power boats had a chance to show their speed under fairly favorable conditions, although some of them had trouble in the seaway. The first leg of the triangular course was used, sailing the three-mile stretch both ways twice, twelve miles in all.

Seven started in the auto boat class, Arrow of Bay City winning in impressive style and averaging better than nineteen miles an hour. De Mooy of Cleveland was second, being unable to travel at top speed because of the sea which almost swamped her.

Wilanna of Detroit captured the cruising class event with, Wistaria of Cleveland second. The summary:

POWER BOATS

Boat	Rating	Allowance	First	Finish	Elapsed	Corrected
Arrow, Bay City	81 80	2 07	2 19 00	2 37 25	37 25	35 18
Demooy, Cleveland	93 90	Scratch	2 21 35	2 42 26	42 26	42 26
P. D. C., Detroit	80 20	2 23	2 27 40	2 53 57	53 57	51 34
Little Grayling	73 8	3 31	2 28 40	2 56 04	56 04	52 33
Stormy Petrel	72 0	3 50	2 28 47	2 57 22	57 22	53 32
Ecce	79 74	2 28	2 29 46	2 56 56	56 56	54 28
Vim	93 00	00 9½	2 24 55	2 53 27	53 27	55 18½

CRUISER CLASS

Boat	Rating	Allowance	First	Finish	Elapsed	Corrected
Willanna, Detroit	54 00	12½	2 33 17	3 05 36	1 05 36	1 05 23½
Wisteria, Cleveland	55 20	Scratch	2 41 00	3 21 35	1 21 25	1 21 25
Viking, Toledo	51 10	0 42	2 49 54	3 38 00	1 38 00	1 37 18

Thursday's Races.—Again Spray, Bonitwo, Invader and Hoorah were winners. The course, four miles to the windward and return took the competitors N. N. W. along the first leg of the triangular course and beyond for a mile, furnishing a fair test of windward ability in a light breeze. Toward the end, when the smaller classes were finishing, the wind hauled slightly to the northwest, but gave no competitor an advantage.

The 21-foot event was a fight for second place, with Spray so far in the lead that interest centered in the others. Otsiketa was first over at the start, blanketing Spray and Ste. Claire. Cleveland and Borealis were last and at once split tacks with the leaders, standing toward North Bass. The others went toward Middle Bass, where the water was smoother and the wind just as good. Spray shook the others, winning by eight minutes, with Borealis second, a minute ahead of Ste. Claire which was one minute ahead of Otsiketa with Cleveland seventeen seconds behind "Otsy."

BONITWO. THIS SLOOP WON IN THE 18-FOOT CLASS AFTER A CLOSE CONTEST WITH FUDGE.

Fudge and Bonitwo indulged in a duel in the 18-foot class race which was won by a narrow margin. Shortly after crossing, the class split and Bonitwo had a slight advantage. She forced Fudge about, but was never more than a few hundred feet in the lead all the way around. On the run home Fudge picked up Bonitwo and was overhauling her fast when the winner slipped over the line with light canvas pulling hard.

Again Invader showed the way for Class A, although given a fight by Enright. In the 16-foot class Hoorah administered a beating of the old sort to Sella II and Gamble, crossing the line about eight minutes in the lead of the Toledo craft.

Friday's Races.—One of the very best races of the week was sailed on the last day between the 21-footers and the universal class. But the 18- and 16-footers had to go over the course again in the afternoon, when they failed to finish inside their respective time limits.

The feature of the 21-foot race was the performance of Cleveland in the hands of John Barth.

The Cleveland Yacht Club candidate went out and behaved admirably under conditions not supposed to be advantageous to her.

The race was triangular and a slide all the way around, owing to the vagaries of the wind. Spray is exceptionally strong off the wind, while Cleveland is at her best going to windward. Nevertheless Barth kept close onto Spray all the way and was beaten by a narrow margin by the champion. Ste. Claire was disqualified by the judges for fouling Borealis.

The start found them getting out spinnakers, Spray and Otsiketa to starboard, the others to port. Cleveland jibed over but the others held, albeit to their disadvantage. The three named were close at the first mark and on the second leg, with sheets slightly started, little change was made in the positions.

Near the end of the leg the wind hauled to the southward, heading off the leaders so they could not fetch the mark without a windward hitch. Cleveland, standing toward Green Island, picked up a slant that gave her second place close to Spray as they rounded for home. They set reaching jibs for the final sprint and Spray held her lead, with Cleveland close at hand all the way.

Invader crossed the line before gun fire at the start of the universal class race and lost time getting back. Then Fernside set his spinnaker to port and had to jibe when he discovered his mistake.

This cost the Canadian first place, for Peck, on Enright made no mistakes and sailed his craft splendidly, winning a well deserved first.

Despite his errors, Fernside finished close enough to get a second, which gave him the long end of the money, a championship flag, the Huntington Cup and some merchandise.

The wind dropped after Enright and Invader finished and the time limit expiring, boats of the 18- and 16-foot classes were towed home. In the afternoon they were started again, sailing over the catboat course (four and a half miles). Fannette won, with Bonitwo second and Yankee third, in the 18-foot class. In the 16-foot class Hoorah and Gamble both defeated Sella II. The breeze was stiff and the races were sailed in fast time.

The 18-foot class finish was a sight to stir a yachtsman's

ARROW, WINNER OF MOTOR BOAT RACE AT PUT-IN-BAY. SHE DID THE 12-MILE COURSE AT AN AVERAGE OF BETTER THAN 19 MILES AN HOUR.

blood. When Bonitwo and Fannette headed for the line the latter was on the starboard tack and the former on the port. As they approached Bonitwo had to give way, losing the race by less than a boat's length, with Yankee thirty-one seconds behind in third place.

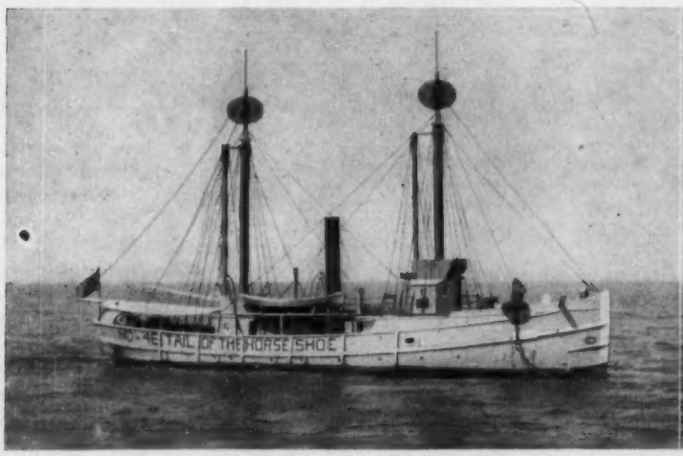
Lucile captured the third straight race in the catboat event, with Holy Stone second and Maude third, the order having been the same all week.

Friday evening prizes were distributed at the smoker and the big silver cups were filled many times with the product for which the Lake Erie islands are famous. The magnificent showing made by Spray—five successive victories—was the cause of congratulation for Commodore Price and the new owner of the champion of Lake Erie went away to try his luck on Lake Michigan, with the best wishes of every sailor present. Considerable criticism was heard over the action of the race committee in confining the Victory Cup to the 21-foot class, when it was offered originally as a free-for-all trophy.

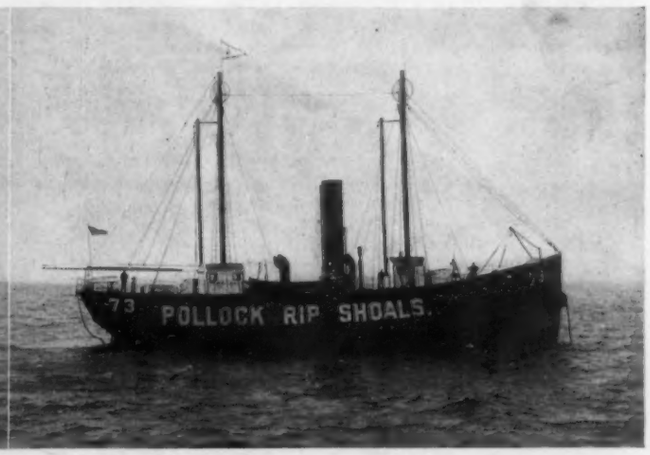
SUMMARY OF WEEK'S RACING.

Yacht	Class	Club	Per Cent.	Yacht	Class	Club	Per Cent.
Spray	21	C.A.A.....	500.0	Bonitwo	18	L.Y.C.....	444.0
Borealis	21	T.B.R.A....	300.0	Fannette	18	L.Y.C.....	368.0
Cleveland	21	C.Y.C.....	240.0	Yankee	18	L.Y.C.....	317.0
Ste. Claire	21	M.Y.C.....	240.0	Fudge	18	L.Y.C.....	243.0
Otsiketa	21	D.C.C.....	220.0	Malillian	18	L.Y.C.....	183.0
Invader	A	R.H.Y.C....	412.3	Hoorah	16	L.Y.C.....	480.0
Enright	A	T.Y.C.....	398.1	Sella II	16	T.Y.C.....	360.0
Elsie	A	T.Y.C.....	333.3	Gamble	16	D.Y.C.....	310.0
Wrinkle	A	T.Y.C.....	333.3	Mascotte	16	M.R.Y.C....	90.0
Ethel	A	M.R.Y.C....	178.6	Lucile	Catboat	T.Y.C.....	300.0
Mildred	A	D.Y.C.....	178.6	Holy Stone	"	T.Y.C.....	200.0
Mermaid	A	D.Y.C.....	166.8	Maude	"	T.Y.C.....	100.0

Abbreviations:—Lakewood Yacht Club, L.Y.C.; Cleveland Yacht Club, C.Y.C.; Chicago Athletic Association, C.A.A.; Detroit Country Club, D.C.C.; Detroit Yacht Club, D.Y.C.; Toledo Yacht Club, T.Y.C.; Royal Hamilton Yacht Club, R.H.Y.C.; Monroe Yacht Club, M.Y.C.; Maumee River Yacht Club, M.R.Y.C.; Tawas Bay Racing Association, T.B.R.A.



THE LIGHT VESSEL WHICH GUARDS THE TAIL OF THE HORSE SHOE SHOALS.



A LIGHTSHIP OF THE FIRST CLASS ON POLLOCK RIP SHOALS OFF CHATHAM, CAPE COD.

The Floating Lighthouses

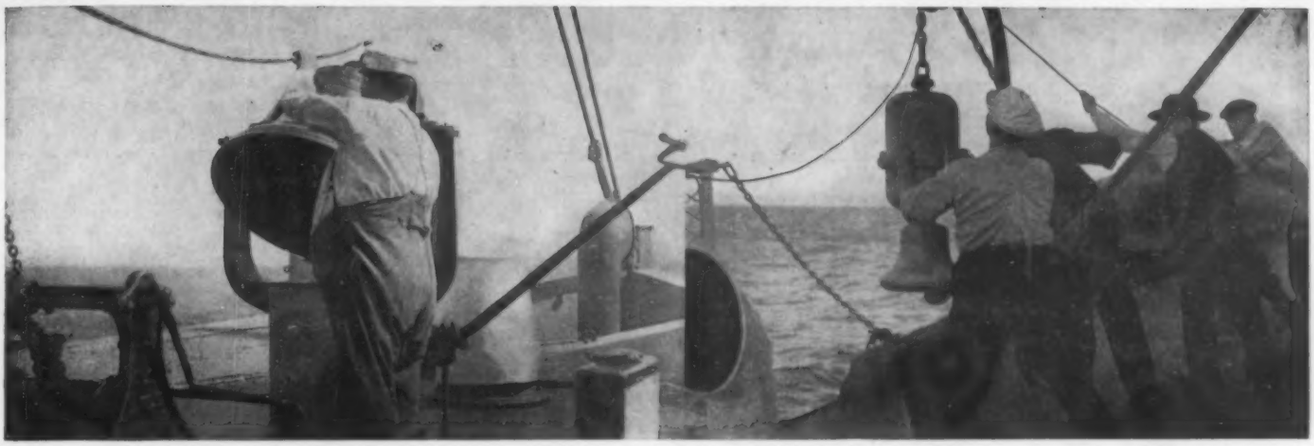
SHOAL, 'WARE SHOAL—HANGING OVER THE SUBMERGED REEF, THE LIGHTSHIP KEEPS WATCH AND WARD LEST CRAFT THAT FARE ON THE DEEP COME TO AN UNTIMELY END—THUS FAR, NO FARTHER IS THE WARNING, AND THE MARINER'S SEEING OR HEARING, KNOWS HIS BEST FRIEND AND "SHEERS OFF"

By C. H. CLAUDY

Photographs by the author

PAINT, paint, paint! Scrub, scrub, scrub Eat, sleep, stand watch, get wildly excited over a sail miles away,—paint, scrub, work! Such is the life of the officers and crew of the lightships. Nothing to do but stay there; nothing to see but water and passing ships, nothing to eat but seventeen cents worth of food a day (fifty cents a day for officers) and this, three months at a time! It is the other end of the pleasures of the sea—the small, hard end of the stick that some one has to hold on to, that the rest can ride in safety.

There is never a lightship where there can be a lighthouse, and there is never a spot too bad to put a lighthouse in or on that isn't pretty dangerous all the time—in bad weather a veritable yawning door to a marine tomb. What other ships shun as they would the Flying Dutchman, the lightship hugs as if it were her life—as, indeed, it is and the lives of many another ship and man as well. Generally it is a shoal she guards other ships from striking upon—a shallow with no sign above the surface to say to the heavy laden freighter or the deep draught liner, "thus far and no farther." Where peculiar configuration of mainland fixes the contour of a current so that a dead spot of drift catches all the sand and forms a bar or shoal, there, if it is far from shore, is a lightship. The most famous of these in United States waters are the "Deadly Diamonds," the Diamond Shoals, Inner and Outer, off Cape Hatteras, on the coast of North Carolina, where storms sweep and seeth and rage the year 'round, and where a calm day, or a sea so gentle that men can eat at a table without tying down chairs and holding plates in hand, is a day to be marked with a white stone! Here, year in and year

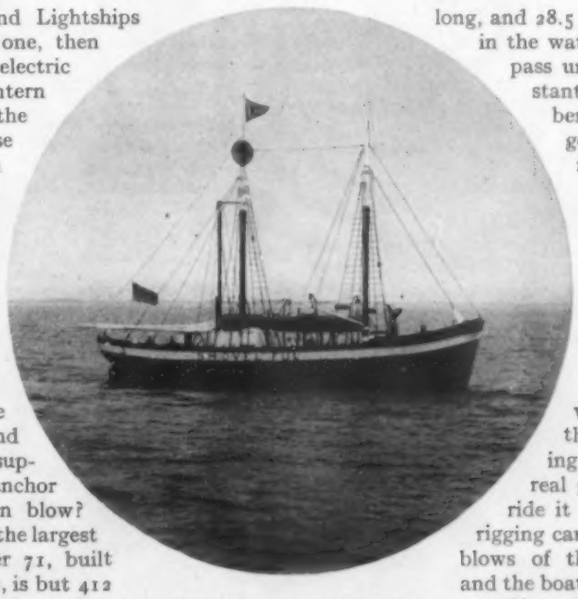


AS THE SEA FOG SETS IN, THE LIGHTSHIP BELL CLANGS OUT ITS WARNING THROUGH THE MURKY PALL. THIS IS SUPPLEMENTED BY A WHISTLE. THE NUMBER OF STROKES WHICH ARE SOUNDED ON THIS BELL INDICATE THE NAME OF THE VESSEL FROM WHICH IT SOUNDS.

PUTTING OVERBOARD THE SUBMARINE BELL. THIS APPARATUS IS SUSPENDED UNDER WATER AND THE NOTES ARE PLAINLY HEARD BY MEANS OF TELEPHONE RECEIVERS ATTACHED TO THE HULLS OF VESSELS, BELOW THE WATER LINE. THE BELL HAS BEEN HEARD AND ACCURATELY LOCATED AT A DISTANCE OF TEN MILES.

out, three months at a time, stand Lightships Number 71 and Number 72—first one, then the other, with clusters of electric lights in lensed and prismed lantern cages, seventy feet above decks on the mastheads, to show the coastwise trade—little enough it is too, in small bottoms—that to the west lies danger and death, to the east, the struggle with the Gulf Stream flowing north, which yet spells safety.

Captain, first mate, chief engineer, assistant engineer, two boys from the Navy running the wireless station, and a crew of ten men besides, man these vessels, which are among the largest in the service. And how big a lightship, do you ask, is supposed to ride in safety and at anchor through the worst storm which can blow? Four hundred and fifty gross tons is the largest lightship in the service, and Number 71, built in 1898, two years before Number 72, is but 412 gross tons. Built of steel and wood, 112 feet long, and 28.5 feet beam, these vessels, riding high in the water and built to roll and let the seas pass under, are regarded as the most substantial lightships in the world. Number 72 has broken her moorings and gone ashore, but escaped with no injury—71 as yet has had no such trouble. But it is not a great surprise when a lightship does break loose—rather it is a wonder that they do not do so oftener. The heavy chain cables, some of them hundreds of fathoms long, while supported with a riding buoy to take the jerk, must nevertheless support an enormous strain. And when the sea gets angry and pulls at the staunch little boat, it is astonishing to those mariners whose idea of a real gale is to scud before the blast or ride it out hove to, where the hull and the rigging can bend and give to the thumps and blows of the gale, that the chain still holds and the boat still stays afloat. Life aboard a light vessel is not pleasant or monotonous at such times.



THE SHOVELFUL LIGHTSHIP.

A MORNING SCENE. SWABBING DOWN DECKS.

THE LANTERNS ON A SECOND CLASS SHIP.

There are at present forty-nine lightships in American waters, on station, and eleven in the relief service, taking the place of ship after ship as its time is up and it comes into port. Three months is the limit fixed by law that men can be kept at sea in this service, and three months, let it be said, is long enough. Think of being caged for that length of time—with limited resources of amusement and, far worse, limited resources of work. That is why cleanliness is so esteemed on a lightship and why she is painted, painted, painted, from the time she leaves port until she gets back again. It is something to do, something to be done slowly and carefully and lovingly—for when work gives out, and idleness sets in full tide, then trouble begins. And to be shipmates with trouble in the form of idle squabbles, with no relief in sight for three months, is no joke for even a hardened sailor man.

Unfortunately the low rate of pay and the poor food allowed on these ships has the effect of filling the service with a foreign element. This is all right as concerns the officers—for whether foreign or native born, no man becomes captain on a light vessel who has not proved his seamanship and his judgment. The post, ill paid as it is, is too important to trust to incompetent hands. But the crew often leave something to be desired, and this lack is, perhaps, more felt by themselves, poor For when work is done, and all fellows, than by anyone else games played threadbare, what is there left but talk and reading? And if one's experience and vocabulary are so limited as to permit argument only by billingsgate or belaying pin, and reading is an affair of spelling out the little words and wondering what the big ones mean, what then is left to stave off the deadly monotony of the life?

Of course there are plenty of Americans in the service, and plenty of these are uneducated and have a more or less stupid time of it—but as a rule the American seamen have a better time doing nothing, and knowing how to do it, than the foreigners.

Of course there are some diversions not altogether to be despised. There is the passing liner, and coastwise boat, and the officers of these seldom have trouble in getting a bundle of magazines together from sympathetic passengers for the lightship crew. I first saw this unique transfer while aboard Number 71. We were on deck together, Captain Adams and I, when he suddenly sang out to the mate, "Johnson, lay a crew aft for the starboard boat—magazines coming up!" I looked and looked, but all I saw was a black steamer bound south. I got my glasses on her just in time to see a regular old sea horse flourish an arm, that means so much, and a white something sprang from the rail to the sea. The boat was lowered smartly and in spite of the heavy swell, a bunch of men dropped lightly into her and gave way for the object, whatever it was, bobbing on the waves. When she returned, the object proved to be a big bundle of magazines. Soaking wet of course but readable, for all that, when dried out in the galley!

"Sometimes it's a side of beef," said Captain Adams,—"sometimes it's a box with some green stuff (vegetables) and I don't know which is the more welcome!"

The masters of passing ships, feeling their own freedom and their pity and respect for the lightship mingled, do much to lighten the tedium of the station work, and while they cannot stop for a game and a friendly hand-shake, the flourish over the rail and the something dropped to the sea to be picked up by the lightship crew is much more to those it is meant for than it sounds in the telling.

The wireless outfits now installed on so many of the vessels by the Navy Department has meant more to the officers and crew of the lightships than they can realize. In the first place they get the daily news as it travels through space and is picked up and read off to the Captain. They get weather bulletins and a blow no longer takes them unawares, or with only the warning the barometer and experience can give. They are able to communicate with shore in emergency and to ask

INCIDENTS IN THE LIFE OF THE LIGHTSHIP MEN. GETTING READY TO LOWER THE SMALL BOAT TO OBTAIN READING MATTER FROM AN OUTGOING LINER—LOWERING AWAY—THE RETURN TO THE LIGHT VESSEL—A SUNNY HOUR ON DECK.

relief or supplies as they may be needed. Not long ago the Nantucket lightship became disabled and was sinking. They "wirelessed" for help and help arrived. Five minutes later and the ship went down. With no wireless all hands would have gone too. The wireless was received on some lightships with the prejudice ignorance has for the new—but you can't find any prejudice against it now. Singularly enough, there is a prejudice in many minds against the "electric ship" as they call the lightship lighted with electricity and showing mastbead lights by the same means. "Too much going aloft in bad weather," you will be told if you ask—and indeed, replacing a burned out globe in a howling storm, seventy feet in the air, with sleet and snow and cold to complicate matters is not the most enjoyable form of amusement one could imagine. I, a land lubber, essayed the ascent of the ratlines to the platform in clear weather and on a fairly even keel. I was holding on pretty tight by the time I reached the top, and when I finally crept fearfully through the little trap to the tiny platform that I might look down on the ship and see it plunging and rearing beneath me, I took a good solid grip on the first thing I could lay hands on, and nothing could have induced me to let go. It is not infrequently necessary to lay three hands aloft to change one light. One man does the work and the other two hold onto him to prevent him from falling overboard. There is less of this work with the oil lights, since they can be lowered to the deck and fixed there if anything goes wrong

There is always some sort of a noise-maker on a lightship—it may be a steam whistle or a siren or a fog horn or a bell, according to locality and the distance at which the noise must be heard, and whenever there is thick weather this noise must be made, for the safety of the passing ship. And so strange are the acoustics of the open spaces that it is not an unheard of occurrence for a passing ship, doing her best to get to seaward of the noise, to run square into the lightship from which it comes.

Many lightships are now equipped with the underwater bell signalling apparatus, and this is also used to warn passing craft of the position of the light vessel—those ships equipped with the telephonic receiving apparatus have a much better method of telling the location of the sound than do those who hear by ear alone. The position of the receiving ship with reference to the underwater bell governs its loudness to some extent, and a clever operator can soon learn from what direction come the sounds of warning.

ONE OF THE LIGHTSHIP'S BEST FRIENDS—A MUSHROOM ANCHOR.

Sea-sick? Well, if you are subject to sea-sickness you want to stay off a lightship, for if there is any feeling more sea-sicky than tossing around in the trough of a sea, anchored and stationary, I don't know what it may be. I was told by one officer that he always got deathly sick at the beginning of a storm—from nervousness, and that although he had been twenty-two years at sea, the habit always persisted.

Many of the vessels have no power of their own, beyond a boiler for heating purposes and to work the winch, but the newer and more modern vessels are equipped with engines and propellers and cannot only get to and from station under their own power but can use their engines to take the strain off the cables in a heavy storm, and more important still, if they break away and are driven ashore, can in some measure pick and choose where they shall land.

The lightships are inspected regularly, kept strictly up to their work, and are as dependable and as much depended upon, as the lighthouses, without which there could be no coastwise navigation at night. Yet just because there is the sometimes realized chance of a break away, a drifting ashore, or the lights being either out or off station—and a lightship off station from a dragging anchor is worse than none at all—there is a strong demand that wherever or whenever possible, the lightship be replaced by the lighthouse. In some cases, as at the Diamond Shoals, this has been tried and proved a failure, yet a light closer to the shoals than it is possible to put a ship is badly needed—and higher in the air and so farther visible than the

(Continued on page 300.)

THE "WIRELESS ROOM." HERE REPORTS OF INCOMING VESSELS ARE RECEIVED AND TRANSMITTED.

A POPULAR DIVERSION ON BOARD SHIP. THE CHIPS ON THE TABLE REPRESENT MERELY CHIPS.

CARLOTTA, A RECENTLY DEVELOPED TYPE OF HIGH SPEED CABIN LAUNCH DESIGNED ESPECIALLY FOR USE ON MOUNTAIN LAKES AND INLAND WATERS. SHE IS 40 FEET LONG AND HAS A 75 H. P. ENGINE. SPEED 18 MILES PER HOUR.

Motor Boats For Inland Waters

THE ADAPTATION OF HULLS AND EQUIPMENT TO LOCAL CONDITIONS INVOLVES AN INTERESTING STUDY—BOATS BUILT FOR COMPARATIVELY SMALL BODIES OF WATER SHOULD BE THE GAINER IN LINES THAT MAKE FOR SPEED AND BEAUTY

By A. S. ATKINSON

Photographs by courtesy of Electric Launch Company, Gas Engine and Power Company and Matthews Boat Company

SHOULD a special type of boat be used for navigating inland waters? If one studies the various craft used on the lakes, rivers and canals, he will become satisfied that there is a general tendency to adapt hulls and equipments to different local conditions, and that this work has progressed far enough in many sections to prove of general value and interest. For the most part a motor boat intended for navigation on small bodies of water does not require the same seaworthy equipments essential for salt water, and by modifying the type somewhat a gain in speed and beauty of line is obtained without increasing the danger. In the matter of seaworthiness for rough water the dory stern is probably the best, but in inland waters it is not as suitable a type as the torpedo, battleship or compromise stern. The dory stern is also unsuited to a twelve-mile speed or better. A slight overhang stern serves the purpose well in a motor boat of from twenty to twenty-five feet for inland navigation. A plum stem with very full deck line and flaring sections above the water is commonly adopted on the larger inland lakes where considerable sea is often encountered.

The owner of a motor boat for inland waters demands as a rule a higher average speed consistent with safety and good seaworthiness than one who intends to use his craft in the bays and sounds along our coast. Owing to the construction of canals and the deepening of many of the smaller rivers, it is possible now to navigate hundreds of miles, and, in some cases, over a thousand miles of fresh water lakes and rivers. To cover such distances speed is an essential factor. The ideal type of boat for inland navigation should thus have at least a twelve-mile speed, and higher if possible.

The selection of the engine and the placing of it in the boats is a matter that is partly dependent upon the body of water for which the craft is intended. If the seas are to be generally rough the engine needs protection of a permanent nature, and its location in the stern of the boat is somewhat doubtful unless a hunting cabin is provided. A hatch of some kind is important. The use of the spray hood has partly done away with the hatch effect or the old type of hunting cabin. But even a spray hood proves sometimes inconvenient in big seas. The location of the engine in the bow so that it can be protected from the spray by a very small hatch or overhang will probably give the best results for rough waters.

But the average inland motor boat has its engine located in the middle of the craft, and for all around purposes this proves the most satisfactory. It gives the ideal balance to the engine and hull, and makes the shaft sufficiently long to prevent friction and loss of power. It also makes it unnecessary to give a sharp pitch to the shaft, and thus lessens the draft of the boat. The ill-advised designing of a boat with the engine placed far astern

THIS BOAT CAN MAKE 17 MILES AN HOUR. THE MOTOR IS LOCATED FORWARD UNDER A HOOD. MOTORMAN'S SEAT IN REAR OF HOOD OVER GASOLENE TANK. A GOOD RIVER BOAT

HIGH SPEED GASOLENE PLEASURE BOAT. A BOAT OF WHICH IT HAS BEEN SAID THAT IT SERVES ONE IN WATER AS WELL AS AN AUTOMOBILE SERVES ONE ON LAND.

A BOAT FOR CRUISING IN SMOOTH WATERS—SHE HAS LARGE ENCLOSED CABIN WITH COCKPITS FORE AND AFT, AND BRIDGE DECK—TYPE OF BOAT POPULAR ON LAKE GEORGE AND CHAUTAUQUA LAKE—ELECTRIC MOTOR CAPABLE OF PRODUCING SPEED OF TEN MILES PER HOUR.

cannot be too severely condemned for inland navigation where many shoal places must be met. The sharp inclination of the shaft necessary with the engine so placed increases the draft by several inches. In addition to this the highest efficiency of the engine is reduced, and more vibration is communicated to the hull. The only possible excuse for locating the engine far in the stern of the boat is to provide more room in front for passengers and to economize in the cost and length of the shaft.

When located in the middle of the boat the engine must divide the space into two compartments, and in a very small boat this makes accommodations somewhat restricted and unpleasant. The best place for an engine in a boat less than twenty feet in length is forward, leaving ample space aft for the occupants. This necessitates a long shaft and a long exhaust pipe if the burnt gases are discharged over the stern. But the extra smoothness of running, and greater efficiency obtained from the engine by such a method, amply compensates for any other loss.

A WELL DESIGNED OPEN BOAT WITH A CREW OF ONE. DESIGNED FOR WATERS ORDINARILY CALM, WHICH, HOWEVER, KICK UP A LIVELY SEA AT TIMES.

TYPE OF CRUISING BOAT USED ON THE MISSISSIPPI RIVER ABOVE ST. LOUIS.

There are as many methods of locating the exhaust pipe as there are ways of building boats, and one may often have good reasons for his method which another fails to understand. An exhaust discharged on the side from an engine located well forward is very apt to spread the odors and fumes into the boat when the wind is blowing in the right direction. If the discharge can be made under water it does not matter if the pipe is forward and close to the engine. The ideal method is to discharge at the stern, and if possible under water. But here, too, several difficulties are encountered. A long exhaust pipe retards proper working of the engine, and if in addition to this the discharge is made under water there is danger of choking the engine. To obviate both of these difficulties there must be careful designing for each individual case.

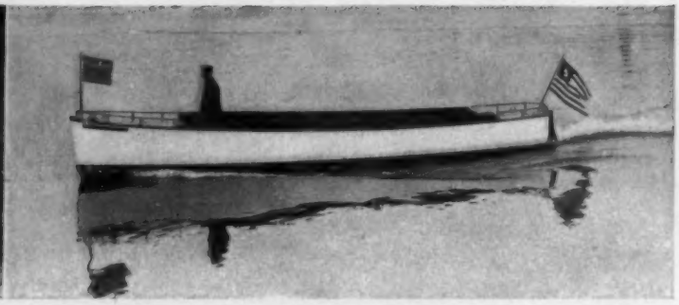
Another objection sometimes urged against locating the engine in the forward part of the boat is that it is too close to the gasolene tank. This, however, is an objection that has been practically removed through the improved manufacture of fuel tanks which are supposed to be absolutely safe. They are even described as "fool proof." These modern tanks are seamless and there is no danger of a leak. The whole tendency of modern motor boat building is to eliminate first of all every possible danger, and after the factor of safety is assured to make the craft speedy and commodious.

It should not be understood that the racing motor boat is more popular on inland waters than on the coast. The speedier craft found on the St. Lawrence, Lake Champlain, on the lakes and streams of Canada and on the Great Lakes are not racing types in any sense of the word. They are simply built with hulls that cut the water with the least possible amount of friction, and are not handicapped by sheer bows and high sterns. Their water lines are designed for speed without limiting their safety in ordinary water. A good many of these boats could not stand a long, rough sea. In fact, the majority give the large river and lake steamboats a wide berth to avoid their swells. But they are capable of going through almost any water that a motor boat is called upon to navigate. The typical racing boat is practically disappearing except for special use, and one sees fewer of these than ever on our inland waters. In place of them the semi-speed, comfortable cruising craft have appeared. Such a boat is capable of making from twelve to fifteen miles per hour, and it can navigate deep and shallow waters and carry a good crew without inviting danger.

HIGH SPEED OPEN BOAT WITH PLUMB STERN. A RIVER BOAT FOR DAY RUNS.

Another change noticeable in many of the inland water boats is in the propeller. A few years ago the large propellers were generally used. In boats of 25 feet in length, and 5 feet in beam, the propellers were often 26 inches in diameter. But on a great many boats to-day the 22-inch screws are preferred. It is a rule generally recognized among motor boat makers that more efficiency is lost through too large than too small propellers. An engine rated to drive a 20-inch propeller 800 revolutions will, when fitted to a 24- or 26-inch propeller, barely make more than 500 or 600 revolutions. In order to make up

AN OPEN BOAT WITH TURTLE BACK FORWARD TO KEEP OUT RAIN AND SPRAY. SHE IS USED ON THE DETROIT RIVER.



A LAUNCH POPULAR ON THE INLAND LAKES OF THE NORTHWEST. SHE IS SIXTEEN FEET LONG AND IS FITTED WITH A 16 H. P. ENGINE.

for this difference in revolutions, the larger blade must do nearly double the work in forcing the boat ahead. A motor boat of 22 feet length and 5 feet beam used on the St. Lawrence last season was equipped with an 8-horsepower two-cylinder engine. It had a 26-inch propeller with a pitch of 24 inches. The best speed that the boat could make was about 8 miles an hour. The hull was apparently well designed, with a torpedo stern, and when in the water the propeller blades had their tips covered by several inches of water.

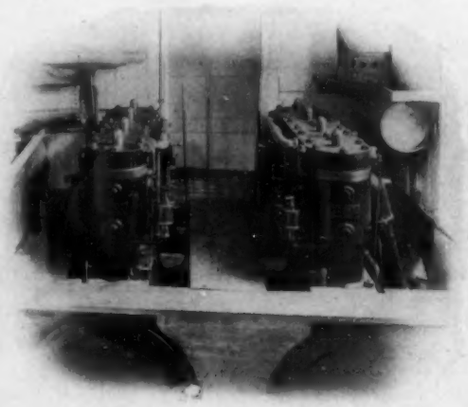
The boat was not making the speed it should, and the question of installing a larger engine was discussed seriously. Finally as an experiment new propeller blades of the reversible and adjustible type were tried. These were 24-inch blades, and the speed of the boat was immediately increased. A further reduction in the diameter of the blades of 22 inches brought the speed of the boat up to nearly 12 miles per hour. Such a slight thing as the reduction of the propeller blades thus wrought an improvement that converted the boat from a doubtful bargain into a craft of great value. A 12- or 15-horsepower engine may have produced like results, but there would have been the great expense of a new engine and the increased cost of fuel consumption.

Economy of operation is one of the things which the novice does not always consider in ordering a new boat. His method of reasoning is a good deal like this: If a 6-horsepower engine will drive his boat at a speed of 8 miles, a 12-horsepower engine must give a speed of about 12 miles. On this basis he generally orders an engine altogether too large and heavy for his boat. Efficiency of all parts is more to be desired than size and weight of engine. A small engine with all parts proportionately designed will give better satisfaction than a large engine with parts not in proportion. The heavier the engine in a boat the greater must be its submersion, and there is a certain point beyond which this increased friction in the water cannot be overcome. A large percentage of the horsepower is thus wasted in overcoming this greater friction. To the greater cost of the larger engine must be added the increased expense in fuel.

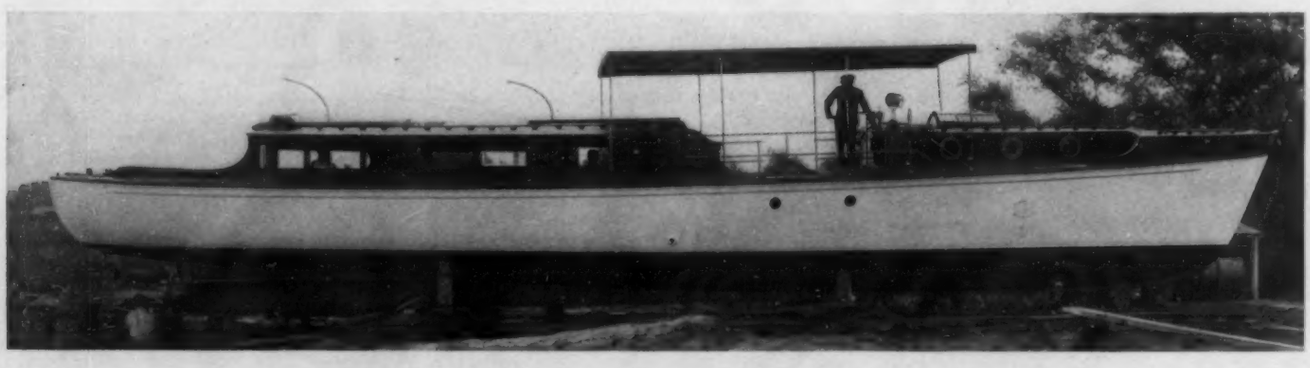
Nothing is so detrimental to speed and high efficiency as to have the tips of the blades near the surface or slightly above it. The effect of this is to carry air under water which forms a cushion against the thrusting surface and thus causes a decided loss in efficiency. The heavier the sea that the boat is intended for the deeper on the average should be the water above the tips of the blades. In many inland streams and lakes where there is scarcely any appreciable swell at any time, the tips of the blades may come within an inch or less of the surface and cause no trouble.

By the proper inclination of the shaft a greater surface can be got into a smaller disc diameter. The tips of the blades should not be brought too near the rudder post, for this causes two faults that are noticeable on many boats. One is that the boat is slow to back, and another is that considerable vibration may be set up when running at full speed.

The greater simplicity of the arrangement and mechanism of the single screw naturally throws the choice in favor of this type, but where speed is considered, twin screws have their use. Separate screws coupled to two three-and-a-half horsepower engines will give more speed than a single screw attached to one seven horsepower engine. The relative size of the blades of the twin screws is considerably smaller.



ENGINES DRIVING A TWIN SCREW MOTOR BOAT.



BOTH HIGH SPEED AND LIGHT DRAUGHT ARE HERE SECURED BY THE USE OF TWIN SCREWS.

SPIRIT.

ALEXANDRA.

The Alexandra Cup Contest on Puget Sound

By FRANK M. FOULSER

Photographs by Walter P. Miller

AMERICANS of the far Northwest are congratulating themselves that Spirit, the winner of the first international contest for the Alexandra Cup was the fruit of local genius. That they did not have to "go East" for help is a cause of much pride and rejoicing—and all the more reason since the other contestant was designed by Fife. In fact, she was the first of that distinguished builder's craft ever to race in Pacific waters.

The cup, a magnificent affair of solid silver, costing some $3000, was presented by Lieut. Governor James Dunsmuir of British Columbia, to be held in perpetuity from race to race. The deed of gift provides that if a year elapses without a contest the cup shall go to a board of trustees, to be held by them until the next event.

The trial races went far to confirm the good judgment of designer Ted Geary's backers. Winowna—another 29-footer, built almost identically along the lines of Tabasco III, whose record in Massachusetts Bay was something of which to be proud, was left behind anywhere from 5 to 21 minutes in a 12-mile windward and leeward tryout. The Crowninshield-designed Imp and Owosca, a likely craft from Binney's board, were even more severely pommeled. But when the time came to measure up the American boat with her real rival there were many who glanced upon the long, clean, graceful lines of Alexandra with a justifiable sense of misgiving. Pride of locality, as well as confidence, was responsible for many of the bets which were laid on Ted Geary's splendid production.

SPIRIT CROSSING THE LINE IN FIRST RACE, A WINNER BY FIVE SECONDS.

The two boats measured up as follows:

Alexandra, length over all, 46 feet; water line, 29 feet; beam, 8 feet 2 inches; draft, 5 feet; sail area, 1350 square feet; ballast, 7660 pounds.

Spirit, length over all, 43 feet; water line, 26 feet 6 inches; beam, 8 feet 4 inches; draft, 5 feet 8 inches; sail area, 1085 square feet (999 without topsail); ballast, 4850 pounds.

Alexandra, as may be seen from these figures, is a long, rakish-looking craft with overhangs well drawn out, with plenty of ballast and ample sail area. The girth amidships of Spirit follows more closely the usual wine cup appearance of the American cup defenders. Both boats were planked with 15-16ths cedar, but Alexandra presented the perfection of the boat-builder's art in her finish, while her rival sacrificed all of these details for speed and lightness. Resting on an even keel Spirit is not especially good to look upon. She sits high out of water, with rather abrupt entrance forward, but her diagonals are all carried out true and when she is heeled over she rides upon as pretty a bilge as one would care to see. A well lifted stern affords ample driving power as she settles down to work and leaves the smallest possible amount of wake. With her short, deep underbody it is little wonder that Spirit can come about like a top and sail an appreciable amount closer than her formidable looking rival.

Such were the two boats as they came to the line on the second day of July. Alexandra was captained by W. E. Gravely, a man of mature years and broad experience in Puget Sound waters. His crew, selected from the best of the Royal Vancouver Yacht Club—all of those Canadians know how to sail boats—

were men of skill and judgment. With the exception of Scott Calhoun, a young Seattle business man to whom is due a large portion of the credit for financing the challenger, Spirit was manned by lads but little older than her 20-year-old designer. The sails of the American were faultless, while the Canadian-built canvas of Alexandra, was manifestly ill-fitted. But the training and severe discipline to which Geary has submitted his assistants stood them in good stead and saved them from stagefright before the thousands of spectators who crowded to the side of every conceivable craft and shouted for their favorite. The details of the three days' racing would occupy more space than can be afforded in this article, but in brief the results were as follows:

SPIRIT HAULING A BIT CLOSER.

The first race was sailed on July 2d, starting at 2.30. The course was an equilateral triangle, four miles to the leg. The wind was from the northwest, and fluky. By clever manœuvring Spirit gained the lead at the start. To windward she showed her fine qualities, turning the buoy about a half mile ahead of her rival. After that she increased her lead, although Alexandra did splendid work running free. On the last leg Spirit got it calm, and the ensuing wind brought the Fife boat well up before it touched her. So close were they at the finish that the American barely beat the Canadian by five seconds. Spirit made the course in 2:49:00, Alexandra in 2:49:05.

The Canadians won the second race in which the American again demonstrated its superiority in windward work and the Fife boat in running free. The start was made at 2:40:00 with Alexandra in the lead and finished by the Canadian at 4:39:41 and the Geary boat at 4:39:42.

The third race was sailed in a light wind. The Fife boat crossed the starting line to windward of the American at 1:55:00. However, as usual the Geary boat did better windward work than the Canadian and rounded the west point buoy six minutes ahead of her rival. On the next leg Alexandra failed to pick up so much of her lost ground as her skipper had hoped to do and she finished at 4:00:00, just three minutes and forty-five seconds behind Spirit.

It is estimated that over $20,000 changed hands and the winners were eager to show their appreciation.

Geary expects to improve somewhat on the present model for next year's races. One thing he looks forward to is the adoption of stricter scantling restrictions, although he maintains that his boat can stand considerable strain and he has challenged his competitors to a hundred-mile race from Seattle to Cape Flattery over the rough waters of Puget Sound.

"I'll show them," he exclaimed when word was brought him that his victory was attributed by some of the losers to favorable weather conditions, "that Spirit is no basket."

His challenge has not been accepted yet. Probably the rules used by the Northwestern International Yacht Racing Association which are practically those adopted at the last International European Congress, will be altered a trifle to suit local conditions.

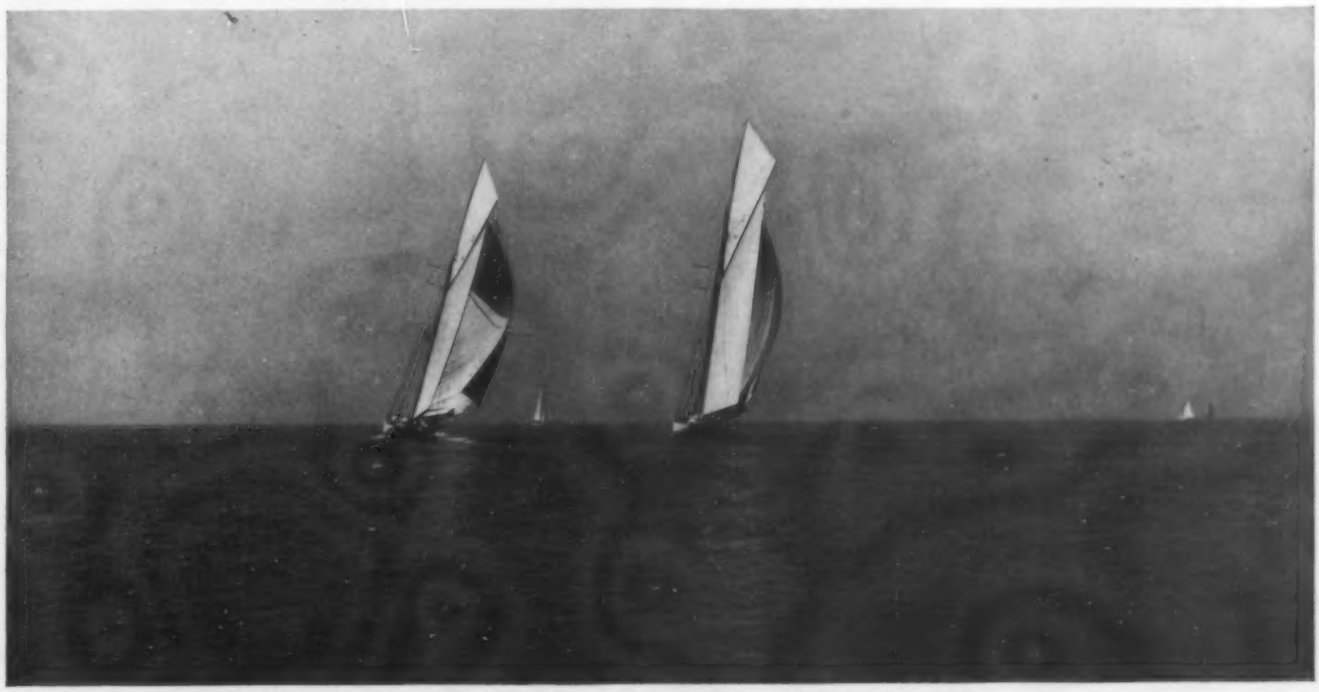
The plans for the Dunsmuir Cup which are now in the hands of its designer, W. H. Archer, hydrographer of the Royal Vancouver Yacht Club, call for a handmade, solid silver punch bowl about sixteen inches in diameter decorated with appropriate symbols in carving and enamel.

Bright promise certainly greeted Ted Geary at the outset of his career. He is measurer for the Northwestern International Yacht Racing Association, Vice-Commodore of the Eliot Bay Yacht Club and honorary member of the Everett and Seattle Yacht Clubs. His first serious work was Empress, a skimming dish of the most approved type, which in the hands of her designer cleaned up everything in her class, or, for that matter, out of her class for some four years. Then, becoming satiated with her success, her owner disposed of her and built a second Empress somewhat larger and a trifle different in type from her predecessor. Empress II remained unbeaten until this year when the challenger for the Dunsmuir Cup ran away from her in the try outs as though she were a shallop.

EMPRESS I, WHICH MADE TED GEARY'S REPUTATION, WINNING FROM DIONE OF THE ROYAL VANCOUVER YACHT CLUB.

The story of the building of Spirit told me by Geary was a whimsical mixture of technicalities and modern slang; but it was from another source entirely that I learned of the almost insurmountable obstacles which had to be overcome

before the boat left the ways. In the first place there were no funds. To build a skipjack for an afternoon's fun is one thing, but to convince a syndicate of hard headed business men that a mere boy could compete with the greatest of England's designers was a horse of an entirely different color. Yet young Geary went—model in hand—to the Seattle Yacht Club and promised to build, for less than three thousand dollars, a 29-footer which would successfully compete for the $3000 prize. He was taken at his word. Upon the summit of Queen Anne Hill, four hundred feet above sea level, a vacant barn was leased and here on March 26th, the keel was laid down. Only three men could be procured to work on the plan. The doorkeeper, instructed by the building committee to keep out all outsiders, not having seen young Geary, refused the latter admission to the shop on the first day of his zealous service and it was only after returning to town, a distance of some miles, and procuring the member who gave the order, that work was permitted to go on for the day. That was simply an incident. The deed of gift manifestly favored the familiar Fife type. Again the Canadians demanded a fifteen mile triangular course instead of a race to a mark and return, which increased the distance for running and reaching wherein the Englishman has always excelled. They also set a time limit of five hours instead of five and one-half. Despite these discouragements work was pushed with a will, and on May 25th the residents of Queen Anne Hill were treated to the unusual spectacle of a full rigged racing yacht coasting down the two mile grade which leads to the water's edge below the impromptu shipyard. On May 26th, the day following, exactly two months from the driving of the first nail, the yacht bowled merrily across Seattle Harbor under full sail.



INGOMAR AND QUEEN, SAILS FILLED WITH WIND AND SUNLIGHT.

Résumé of September Races

Photograph by James Burton

EASTERN YACHTING

SLOOPS—CLASS P, 22 TO 27 FEET—COURSE, 12 MILES—START, 3.05.

	Elapsed Time. h.	m.	s.
Sue	2	17	10
Sakana	2	22	25

Corrected Time—Sakana, 2.18.37.

SLOOPS—CLASS Q, 18 TO 22 FEET—COURSE, 12 MILES—START, 3.10.

Eleanor	2	11	35
Spider	2	19	05
Little Rhody	2	20	15
Capsicum	2	20	40
Joy	2	22	38
Soya	2	22	43
Vingt-trois	2	22	49
Dorothy Q	2	23	41
Saetta	2	24	08

SLOOPS—CLASS Q, SPECIAL—COURSE, 8 MILES—START, 3.15.

	Elapsed Time. h.	m.	s.
Careless	1	48	33
Ondas	1	48	50
Spots	Withdrew		

Corrected Time—Careless, 1.47.20.

SLOOPS—CLASS S, UNDER 15 FEET—COURSE 8 MILES—START, 3.25.

M & F	1	48	15
Bensonhurst	1	49	00
New Moon	1	50	50
Goblin	1	51	30
Nereid	1	56	20
Blue Bill	1	51	50
Gunda	Withdrew.		

GRAVESEND DORIES—COURSE, 4 MILES—START, 3.35.

	Elapsed Time. h.	m.	s.
Nancy	1	02	40
Ace	1	04	50
Masque	1	08	20
Cherub	1	09	15
Joker	1	09	40
Bobs	1	13	30

CRESCENT ATHLETIC CLUB

LIPTON CUP RACE—COURSE, 8 MILES—START, 10.16.

Nereid	2	05	59
Gunda	2	07	15
New Moon	2	09	24
M & F	2	11	46
Bensonhurst	2	13	51
Goblin	Did not start.		
Blue Bill	Did not start.		

YACHT RACING ASSOCIATION OF GRAVESEND BAY—STATEN ISLAND CRUISE

SLOOPS AND YAWLS, CLASS P—COURSE, 7 MILES—START, 3.40.

	Elapsed Time. h.	m.	s.
Lillian	1	25	03
Miana	1	30	19
Sakana	1	34	19
Flaneur	1	34	25
Imp	2	00	25
Squaw	2	08	50
Guide	Did not finish.		
Aglaira	Did not finish.		

Corrected Time—Lillian, 1.25.03; Miana, 1.25.19; Sakana, 1.34.19; Flaneur, 1.49.25; Imp, 1.30.25; Squaw, 1.35.50.

SLOOPS, CLASS Q—COURSE, 7 MILES—START, 3.45.

	Elapsed Time. h. m. s.
Spider	1 19 10
Quest	1 19 59
Soya	1 20 39
Vingt-trois	1 22 22

Corrected Time—Quest, 1.14.59.

SLOOPS, Q SPECIAL CLASS—COURSE, 7 MILES—START, 3.45.

Careless	1 31 19
Ondas	1 37 52
Truant	1 41 30
Spots	1 42 25

LOOPS, CLASS S—COURSE, 7 MILES—START, 3.40.

M & F	1 34 02
Nereid	1 34 32
Goblin	1 39 59
Blue Bill	1 52 35

SLOOPS, CLASS S SPECIAL—COURSE, 5 MILES—START, 3.45.

Gamma	1 33 42
Beta	1 35 45
Delta	Did not finish.

DORIES—CLASS X—COURSE, 5 MILES—START, 3.45.

Jack	1 34 50
Nancy	1 40 02
Ace	1 40 52
Deuce	1 48 59
Joker	Did not finish.
Boler	Did not finish.

DINGIES—COURSE, 5 MILES—START, 3.45.

North Star	2 28 20
Vigo	Sunk.
Mercury	Did not finish.

CATBOATS—COURSE, 5 MILES—START, 3.45.

Colleen	1 42 03
May	Did not finish.
Marrutia	Not timed.

ATLANTIC YACHT CLUB

SLOOPS—CLASS Q, 18 TO 22 FEET—COURSE, 8 ⅓ MILES—START, 3.10.

	Elapsed Time. h. m. s.
Soya	2 02 45
Spider	2 05 91
Joy	2 06 06
Vingt-trois	2 06 30
Saetta	2 06 57
More Trouble	2 09 17
Quest	2 13 18

SLOOPS—CLASS Q, SPECIAL—COURSE, 8 MILES—START, 3.15.

Careless	1 43 03
Spots	1 44 53
Ondas	1 48 48

Corrected Time—Careless, 1.42.43; Spots, 1.43.49; Ondas, 1.48.48.

SLOOPS—CLASS S, UNDER 15 FEET—COURSE 8 MILES—START, 3.25.

Bensonhurst	1 37 40
M & F	1 39 21
Goblin	1 42 45
New Moon	1 42 52
Nereid	1 42 54

GRAVESEND DORIES—COURSE, 4 MILES—START, 3.35.

Nancy	0 53 50
Deuce	0 56 23
Masque	0 56 55
Joker	0 58 05
Bobs	1 00 09
Cherub	1 04 05

BENSONHURST YACHT CLUB

SLOOPS, CLASS Q, 18 TO 22 FEET—COURSE, 12 MILES—START, 3.15.

	Elapsed Time. h. m. s.
Dorothy	2 14 27
Soya	2 16 31
Spider	2 18 15
Vingt-trois	2 20 07
Capsicum	2 21 05
Joy	2 21 19

GRAVESEND DORIES—COURSE, 4 MILES—START, 3.25.

Nancy	1 02 03
Ace	1 05 59
Deuce	1 08 52
Joker	1 09 48
Cherub	Withdrew.

NEW YORK YACHT CLUB AUTUMN CUPS

SLOOPS, 68-FOOT CLASS—COURSE, 18¼ MILES—START, 2.55.

	Elapsed Time. h. m. s.
Neola	2 46 04

SLOOPS, 57-FOOT CLASS—COURSE, 18¼ MILES—START, 3.00.

Aurora	2 32 35
Winsome	2 39 05
Istalena	2 42 51

Corrected Time—Aurora, 2.30.36; Winsome, 2.37.04; Istalena, 2.40.50; Neola, 2.46.04.

N.Y.Y.C. 30-FOOTERS—COURSE, 9½ MILES—START, 3.10.

Alera	1 38 58
Nepsi	1 40 17
Adelaide	1 40 24
Banzai	1 42 31
Atair	1 43 10
Phryne	1 45 31

SLOOPS, CLASS J—COURSE, 20 MILES START, 12.15.

	Elapsed Time. h. m. s.
Neola	4 05 35

SLOOPS, CLASS K—COURSE, 20 MILES—START, 12.20.

Istalena	4 28 50
Winsome	4 36 13
Aurora	4 25 34

YAWLS, CLASS M—COURSE, 20 MILES—START, 12.30.

Peggy	Not timed.

N. Y. Y. C. ONE DESIGN 30-FOOT CLASS—COURSE, 15 MILES—START, 12.35.

Phryne	4 47 17
Atair	4 40 20
Nepsi	Not timed.
Alera	4 16 45
Minx	4 22 55
Adelaide	4 07 45
Dahinda	Not timed.
Banzai	4 34 45

HANDICAP CLASS, 1ST DIVISION—COURSE, 11 MILES—START, 12.40.

Mist	4 46 00
Thelma	4 10 05
Little Peter	4 33 42
Tanya	4 26 07

HANDICAP CLASS, 2D DIVISION—COURSE, 11 MILES—START, 12.45.

Jolly Roger	3 33 38
Jolly Tar	Not timed.
Busy Bee	3 29 28
Tom Boy	4 06 04

HANDICAP CLASS, THIRD DIVISION—COURSE, 8 MILES—START, 12.50.

Huntress	3 03 31
Monsoon	Not timed.
Kenosha I	2 50 30
Kenosha II	3 19 49

HANDICAP CLASS, FOURTH DIVISION—COURSE, 8 MILES—START, 12.55.

Montauk	2 56 14
Firefly	2 44 43

RACEABOUT CLASS—COURSE, 11 MILES—START, 12.45.

Rascal III	3 44 53
Dora II	3 39 54

LARCHMONT 21-FOOT CLASS—COURSE, 11 MILES—START, 12.50.

Dorothy	4 24 37
Vaquero	3 45 42

SPECIAL CLASS—COURSE, 11 MILES—START, 1.50.

Houri	Not timed.
Follette	Not timed.

MANHASSET BAY Y. C. ONE DESIGN CLASS—COURSE, 8 MILES—START, 1.50.

Arizona	3 11 01
Pixy	3 10 31

NEW ROCHELLE ONE DESIGN CLASS—COURSE, 8 MILES—START, 12.55.

Mischief	3 44 32
Nereid	3 39 43
Echo	3 39 59

RHODE ISLAND ONE DESIGN CLASS—COURSE, 8 MILES—START, 12.55.

Lady G	3 49 27
Mystic	3 20 09

INDIAN HARBOR ONE DESIGN CLASS—COURSE, 8 MILES—START, 1.00.

Ace	3 17 20
Nancy	3 24 23
Wacontah	4 01 10
Peewee	3 22 52

CATBOATS, CLASS S—COURSE, 8 MILES—START, 1.00.

Inez	3 23 13
Louie Belle	3 20 59

BUG CLASS—COURSE, 8 MILES—START, 12.55.

Skeeter	3 23 55
Lady Bug	3 36 58
Cricket	3 58 10

RIVERSIDE Y. C. CATBOATS—COURSE, 8 MILES—START, 1.00.

Daomi	Not timed.
Gitty	4 20 33

AMERICAN Y. C. DORIES—COURSE, 5 MILES—START, 1.00.

Tautog	2 50 11
Teddy	3 23 38
Faraway	3 10 48

KNOCKABOUT CLASS—COURSE, 11 MILES—START, 12.55.

Arrow	2 28 30
Bat	Did not finish.

SLOOPS, 27-FOOT CLASS—COURSE, 11 MILES—START, 12.35.

Kazaza	4 01 39

SLOOPS, CLASS R—COURSE, 11 MILES—START, 1.00.

Hamburg	3 02 07

SLOOPS, 22-FOOTERS—COURSE, 12 MILES—START, 3.10.

Soya	2 02 45
Spider	2 05 01
Jay	2 06 06
Vingt-trois	2 06 30
Saetta	2 06 57
More Trouble	2 09 17
Quest	2 13 18

SLOOPS, 22-FOOT SPECIALS—COURSE, 8 MILES—START, 3.15.

Careless	1 43 03
Spots	1 44 33
Ondas	1 48 48

Corrected Time—Careless, 1.42.43; Spots, 1.43.22; Ondas, 1.49.48.

LIPTON CUP BOATS—COURSE, 8 MILES—START, 3.25.

	Elapsed Time. h. m. s.
Bensonhurst	1 35 40
Nix	1 39 21
Goblin	1 42 45
New Moon	1 42 52
Nereid	1 42 54

DORIES—COURSE, 4 MILES—START, 3.35.

Nancy	0 53 50
Deuce	0 56 23
Masque	0 56 55
Joker	0 58 05

ATLANTIC YACHT CLUB

SERIES RACE, CLASS S—COURSE, 4 MILES—START, 3.15.

	Elapsed Time. h. m. s.
Gunda	0 51 00

SERIES RACE, CLASS Q—COURSE, 8 MILES—START, 3.45.

Soya	1 23 40
Joy	1 26 13

SEAWANHAKA CORINTHIAN YACHT CLUB WOMEN'S RACE.

SLOOPS, CLASS Q—COURSE, 4 NAUTICAL MILES—START, 3.00.

	Elapsed Time. h. m. s.
Soya	0 42 40
Spider	0 43 25

BROOKLYN YACHT CLUB

SLOOPS, CLASS Q—COURSE, 8 MILES—START, 3.10.

	Elapsed Time. h. m. s.
Soya	1 18 15
Spider	1 20 15
Joy	1 21 35
Saetta	1 23 50
Vingt-trois	1 25 10

SLOOPS, CLASS Q SPECIAL—COURSE, 8 MILES—START, 3.15.

Ondas	1 33 50
Spots	1 35 25
Careless	1 36 15

Corrected Time—Ondas, 1.33.50; Spots, 1.33.54; Careless, 1.35.55.

SLOOPS, CLASS S—COURSE, 8 MILES—START, 3.25.

M & F	1 31 59
Bensonhurst	1 35 35
Goblin	1 35 40
Gunda	1 35 48
Blue Bill	1 36 35
Nereid	1 42 10
New Moon	Did not finish.

DORIES, CLASS X—COURSE, 4 MILES—START, 3.35.

Masque	0 52 22
Nancy	0 52 55
Deuce	0 54 15
Cherub	0 55 25
Ace	0 56 40
Joker	0 56 50

MANHASSET BAY YACHT CLUB

N. Y. Y. C. 30-FOOT CLASS—COURSE, 21 MILES—START, 12.50.

	Elapsed Time. h. m. s.
Alera	3 33 44
Minx	3 34 50
Nepsi	3 25 31
Atair	3 27 06
Phryne	3 29 15
Adelaide	3 34 07

HANDICAP CLASS, FIRST DIVISION—COURSE, 10½ MILES—START, 12.55.

Tanya	2 56 23
Thelma	2 00 28
Trixie	1 54 19
Mist	2 08 00

Corrected Time, Trixie—1.52.36.

HANDICAP CLASS, SECOND DIVISION—COURSE, 10½ MILES—START, 12.55.

Busy Bee	1 55 47
Rascal	1 58 53
Jolly Roger	2 04 25

Corrected Time—Rascal, 1.55.29.

HANDICAP CLASS, THIRD DIVISION—COURSE, 10½ MILES—START, 12.55.

Monsoon	2 08 36
Mlle. Modiste	2 11 38
Kenosha I	2 04 07
Kenosha II	2 15 57

Corrected Time—Kenosha I, 1.55.35.

HANDICAP CLASS, FOURTH DIVISION—COURSE, 10½ MILES—START, 12.55.

Montauk	2 05 41
Arrow	2 03 47
Wink	2 17 30
Okee	2 15 17
Vivyen	2 36 50

Corrected Time—Montauk, 2.01.58.

RACEABOUT CLASS—COURSE, 10½ MILES—START, 12.55.

Nora II	1 58 48

MANHASSET BAY Y. C. DESIGN CLASS—COURSE, 10½ MILES—START, 1.20.

Arizona	2 26 22
Pixy	2 22 09

NEW ROCHELLE Y. C. ONE DESIGN CLASS—COURSE, 10½ MILES—START, 1.20.

Mischief	2 39 06
Echo	2 36 01
Cricket	Did not finish.

BUG CLASS—COURSE, 10½ MILES—START, 1.20.

	Elapsed Time. h. m. s.
Skeeter	2 33 38
Big Bug	Did not finish.
Scarab	2 44 23
Dragon Fly	2 37 36
Lady Bug	2 41 35
Wasp	Did not finish.
Cricket	1 34 42

AMERICAN Y. C. DORIES—COURSE, 10½ MILES—START, 1.20.

Tautog	3 10 59
Faraway	3 18 46
Teddy	3 07 29

MILTON POINT CATS—COURSE, 10½ MILES—START, 1.20.

Inez	2 36 00
Tuchboo	2 49 45

RHODE ISLAND ONE DESIGN CLASS—COURSE 10½ MILES—START, 1.20.

Lady	2 06 31
Mystic	2 00 06

CATBOATS, CLASS R—COURSE, 10½ MILES—START, 1.20.

Arline	Did not finish.

MIXED CLASS—COURSE, 10½ MILES—START, 1.20.

Y4	1 36 55
Skate	1 44 02

The winners were—Nepsi, Trixie, Rascal, Kenosha I, Montauk, Nora II, Pixy, Echo, Skeeter, Teddy, Inez and Mystic.

EASTERN YACHTING.

JAMESTOWN EXPOSITION YACHT RACE

September 11, 1907.

SLOOPS, CLASS P—RACING FOR ROOSEVELT CUP—COURSE, 15 MILES—START, 12.25.

	Elapsed Time. h. m. s.
Regina	1 36 34
Sue	1 34 58

SLOOPS, CLASS Q—RACING FOR KING'S CUP COURSE, 15 MILES—START, 12.35.

Manhasset	1 35 15
Dorothy	1 39 58
Little Rhody II	1 40 58
Dorothy Q	1 44 46
Eleanor	1 40 08
Capsicum	1 40 07

ROOSEVELT CUP, SECOND RACE FOR SLOOPS, CLASS P—START, 11.15.

Sue	2 02 14
Regina	2 05 54

KING'S CUP, SECOND RACE FOR SLOOPS, CLASS Q—START, 12.05.

Capsicum	2 07 58
Little Rhody	2 08 05
Manhasset	2 08 54
Eleanor	2 08 20
Dorothy	2 10 07
Dorothy Q	2 10 30

The sloop yacht Eleanor, owned by F. W. Fabyan of Boston, won the silver cup given for the Jamestown races by Sir Thomas Lipton. Dorothy Q., another Massachusetts Bay boat, and Dorothy of the Baltimore Yacht Club tied for third place, Sue, bringing up the rear. The contest was decided on points. The final score stood: Eleanor, 12; Dorothy Q., 11; Dorothy, 9; Capsicum, 9; Sue, 3.

ROOSEVELT CUP, SLOOPS 22-FOOT, CLASS Q.

Eleanor	2 32 02
Manhasset	2 34 15
Capsicum	2 38 48
Little Rhody	2 41 16
Dorothy Q	2 40 12
Dorothy	2 45 25

JAMESTOWN EXPOSITION TROPHY

START, 12 25

	Finish. h. m. s.
Dorothy	3 57 51
Capsicum	3 51 55
Little Rhody	2 42 10
Dorothy Q	3 52 02
Eleanor	Not taken.
Margaret	Dropped out.
Manhasset	Not taken.

WESTERN YACHTING
WHITE BEAR YACHT CLUB

READ POWER BOAT CUP.

Boat Owner.	Time.	H'cap.	Net.
Skinner	10 38	1 47	8 51
Hardenbergh	10 54	2 01	8 53
McKibben and Mitchell	9 04	scratch	9 04
Peet	21 10	11 51	9 19
Ingersoll	25 44	16 15	9 29
Ordway	12 40	2 53	9 47
Townsend	23 05	13 16	9 49

Course, triangle in Dellwood Bay, 2.3 nautical miles.

MINNETONKA YACHT CLUB

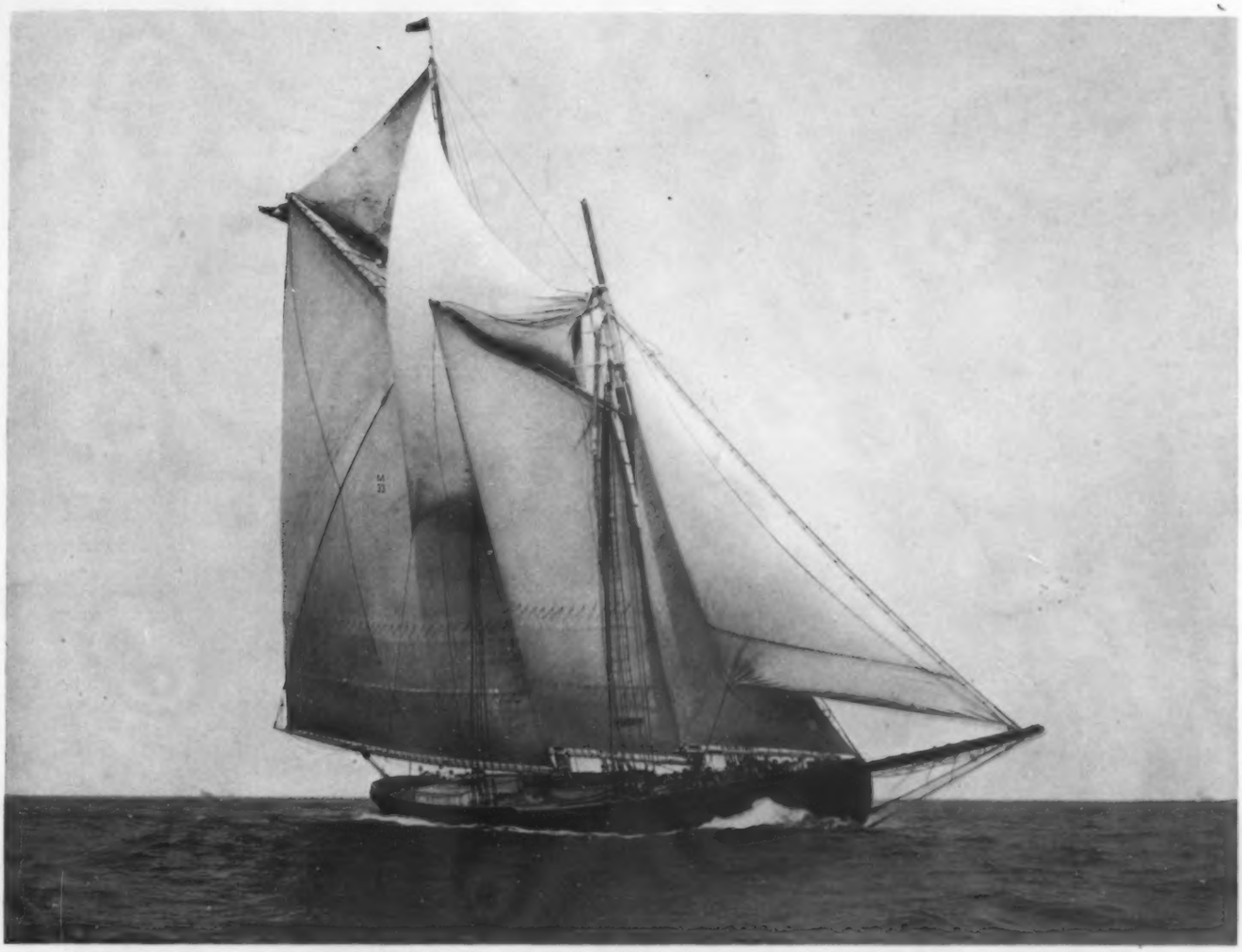
MORNING RACE, CLASS A.

	Start.	Finish.
Minnetonka	10 35	12 02
Tomahawk	10 35	11 56
Crusader	Capsized.	

CLASS B.

Buccaneer	10 40	12 13
Ohiyesh	10 40	12 09
Pathfinder	10 40	12 09
Rambler	10 40	11 16

(Continued on page 296.)



ROSE DOROTHEA, WINNER OF THE LIPTON CUP. SHE SAILED A GOOD RACE AND WON IN SPITE OF THE ACCIDENT WHICH PUT HER TOPSAIL OUT OF COMMISSION. THE PIECES OF THE BROKEN TOPMAST ARE PLAINLY SEEN IN THE ILLUSTRATION.

The Fisherman's Race

GRIM AND HAZARDOUS ARE THE LIVES OF THOSE WHO MAN NEW ENGLAND'S FISHING FLEET—BUT THEY TREAD THE DECKS OF STAUNCH CRAFT AND IN THEM SAIL NOT INFREQUENTLY IN THE FACE OF FATE—HERE IS A STORY OF AN HISTORIC MEETING OF SCHOONERS OVER A MEASURED COURSE IN A RACE FOR A CUP

By JAMES F. McNALLY

Photographs by W. B. Jackson

FIVE of the fastest vessels of New England's fishing fleet competed in a race off Boston Light for the trophy donated by Sir Thomas Lipton. Rose Dorothea, after an exciting contest with Jessie Costa, won and will be the first fishing vessel to have her name inscribed upon the cup. While the fisherman's race was one of the great features of Boston's Old Home Week celebration, the victory of Rose Dorothea brought glory to her home port, Provincetown, and her beautiful trophy was admired by President Roosevelt during his visit to the ancient seaport town at the tip of Cape Cod.

The race between Rose Dorothea and Jessie Costa was one of the best ever sailed between fishing vessels in Massachusetts Bay, and was made more exciting by the fact that the winner carried away her foretopmast. But in spite of her crippled condition she was kept in the fore by her skipper, John Watson. After the race, with a broom lashed to her broken foretopmast, and another at the main truck, the American ensign and her name on a gaudy streamer floating out astern from under her main peak, Rose Dorothea swept proudly up Boston harbor.

Every passing craft which had steam tooted her congratulations, while from the crews of the sailing craft was sent up cheer after cheer. At T wharf, where she docked, there were hundreds of people waiting and they gave the "queen of the fishing fleet" the heartiest welcome.

She won a grand race, a race that was fought from the start to the finish with Jessie Costa, a foe that was ever alert and ever

JESSIE COSTA—HER RACE AGAINST THE WINNER WAS ONE OF THE MOST EXCITING CONTESTS WITNESSED BETWEEN FISHERMEN IN YEARS.

on her trail. As Costa was always within striking distance, the skipper and crew of Rose Dorothea had to use all their skill to keep the vessel in front. Crippled as she was with her foretopmast carried away about twenty feet above the hounds, Dorothea would have surely lost but for her splendid handling.

Capt. Watson, a nephew of Nate Watson, secured his advantage at the start and never lost it. There were but two minutes and thirty-four seconds between Dorothea and Costa at the finish of a forty-mile course and but two minutes between Mesquita and Thomas of the second class.

The boats were sailed for glory, and the skippers never let up in driving their craft from whistle to whistle. The weather conditions were splendid, both from a racing standpoint and for those who wished to witness the contest. Some might argue that there should have been half a gale blowing, but the breeze was strong enough, and there were shifts enough in it to give the skippers a chance to show what they knew about racing and the contest was all that could be desired.

Manomet, which had been entered, passed in with a fare of mackerel as the boats were bound down to the starting line, while Captain William Thomas of the knockabout, Helen B. Thomas, deserves the warmest praise for sacrificing his trip for fish in order to make a race in the second class. Captain Val O'Neil of James W. Parker, the Gloucester representative in the race, entered his boat, although he knew that he did not have a chance in light conditions, and with a band on board and a big crowd of friends he took Parker over the course, game to the last, and finished third in the first class.

There was a light to strong wholesail breeze, with the wind southeast at the start, southeast and east-southeast to south-southwest at the finish. The sea was comparatively smooth, but toward the latter part of the race there was a nice chop with a lively jump to it, which gave life and animation to the going. The skies were bright and clear and the sun shone warm. It was a beautiful day afloat and there was a big flotilla of boats about the starting and finishing lines, while a number of craft followed the racers over the course.

The first class was sent away at 11.10 and the second class at 11.15. The starters in the first class were Rose Dorothea, Captain Marion Perry of Provincetown; Jessie Costa, Captain Manuel Costa, also of Provincetown, and James W. Parker, Captain Val O'Neil of Gloucester.

In the second class were Francis P. Mesquita, Captain Joseph P. Mesquita of Provincetown and the knockabout, Helen B. Thomas, Captain William Thomas of the T wharf fleet.

When the warning signal was given at 11 o'clock the vessels were well to weather of the line, but they came down slowly just before the preparatory whistle sounded. All the boats had fore and main gafftopsails set over lower sails, with the exception of the knockabout, Helen B. Thomas, which did not carry a foretopsail at any time during the race. The boats had their jibtopsails up in stops in true yacht racing fashion ready to break out as they went over the line.

They did not manœuvre very keenly for the start and with the exception of Rose Dorothea, came for the line in a happy-go-lucky way. The latter, however, thanks to the racing experience of Captain Watson, was well timed and came down under good headway. She broke out her jibtopsail just before she crossed and with a good rap full and everything pulling swept across the line with a fair lead over Jessie Costa.

With all their kites drawing and with gafftopsails and maintopmast staysails set, every inch of canvas that they carry, Dorothea and Jessie Costa sailed it nip and tuck at the very start. Before they had sailed very far they were close hauled for the wind headed them a little and so with sheets flattened they raced along for the first mark.

Francis P. Mesquita got away first in the second class, but Helen B. Thomas came down for the line close to the judges' steamboat and hauled her wind as she crossed on the weather of the Mesquita. It was a pretty start, but the skipper of Thomas did not give his boat the more that she should have

had as he approached the line, running out the time with his sheets off.

In the meantime it could be seen that the race between Dorothea and Costa was going to be close. With five minutes start this pair were soon far in the lead. Thomas and Mesquita got the wind more from the southward, and it kept heading them off until their chances for the Lipton trophy were spoiled. The wind knocked off Thomas first and let up Mesquita, and she closed upon her rival. About a quarter of an hour from the start the leading boats were close hauled and both had dropped Parker.

In the meantime, the wind headed the stern boats to such an extent that Thomas and Parker had to take a hitch to windward. Rose Dorothea held her lead and forty-five minutes after the start the breeze took on strength and sent the rails almost down to the water, while the white caps began to show themselves and it looked like real racing.

The boats rounded the first mark at Davis Ledge as follows: Rose Dorothea, 11.45.51; Jessie Costa, 11.47.42; James W. Parker, 11.51.43; Helen B. Thomas, 12.01.52.

After rounding, sheets were eased to port and foresails gybed over to starboard, so wing and wing the boats ran for the whistler off Eastern Point. Costa gained a little on Dorothea, and she was luffed out a little on Costa. The latter could not get near enough to spoil the wind of Dorothea, and the pair made a nice race in the run to the second mark, with the wind southeast and east-southeast on the run.

FRANCIS P. MESQUITA WHICH SAILED A GREAT RACE AGAINST HELEN B. THOMAS.

The rounding times at Eastern Point were: Rose Dorothea, 1.51.47; Jessie Costa, 1.52.22; James W. Parker, 2.04.58; Francis P. Mesquita, 2.14.00; Helen B. Thomas, 2.15.10.

Then came the exciting part of the race. Just as Rose Dorothea hauled her wind as she rounded, the foretopmast snapped and a cheer went up from Costa as they noted the accident and all hands tailed onto the sheets to get them in flat for the first hitch toward home. When the mishap occurred, Watson shot Dorothea up into the wind and held her high but kept her going while the crew cleared away the wreckage and took in the jibtopsail and the foretopsail. It looked as if the accident would cost her the race, but the wind had shifted and was at that time about south, so that even close hauled, the boats would not be able to fetch the finish line, especially as the wind was hauling more to the westward as they raced for home.

Costa tried hard to get on the weather of Dorothea, but Watson held her up too high and luffed out on Costa. By the wind, the accident did not prove so serious as it would if the boats could have laid their course home, for then Dorothea would have lost the use of her jibtopsail and foretopsail which would have meant much to her with such a fleet rival always at her heels.

The skipper of Costa kept his jibtopsail on, and it would have been better for him had he taken it in, for the wind kept knocking him off to leeward and he could not follow the same road as Dorothea.

The wind had taken on strength and was blowing a good wholesail breeze. Dorothea kept working out steadily to weather on Costa. The latter stood well in under Egg Rock, her skipper evidently looking for a favoring westerly slant which might enable him to catch Dorothea. He did get a lift out, but not enough to do the trick.

On the last hitch to the finish line, Costa, though astern, was to weather of Dorothea, but she could not catch her, and with her jibtopsail on, which the skipper persisted in carrying, she could not point as high.

As soon as Dorothea crossed the finish line the whole crew rushed aft and almost mobbed "Johnny" Watson at the wheel. Caps were thrown in the air and the men danced like youngsters, cheering and yelling like a band of victorious savages. They gave their defeated rival a cheer as she crossed, and her reception was almost as great as that of the winner.

The Lipton Cup is to be a perpetual challenge trophy for fishermen. Captain Marion Perry of Rose Dorothea has a sort of elephant on his hands at present, as he will have to defend it if challenged by any of the vessels of the fleet.

HELEN B. THOMAS

TWO OF THE "FISHERMEN" WHICH STRUGGLED OF

D OFF BOSTON LIGHT FOR A BLUE RIBBON

JAMES W. PARKER

ENDYMION LEADING INVADER.

The Indian Harbor Yacht Club Ocean Race

By ARTHUR TOPLEY

Photographs by Edwin Levick and James Huntington

INVADER, Roy A. Rainey's magnificent 95-foot schooner was beautifully sailed in the 400-mile ocean race of the Indian Harbor Yacht Club from Greenwich, Conn., to Hampton Roads, under the auspices of the Indian Harbor Yacht Club early in September, and there were few who saw her finish in grand style, with swelling canvas and perfectly turned hull cutting the water like a knife at 10.40.18 precisely on the morning of September 10th, who did not believe that she was the winner of the long thresh, "by a very large majority," as they say in Norfolk.

ENDYMION. AT ONE TIME SHE HELD A TRANS-ATLANTIC RECORD

And she would have won, too, had not the little 40-foot schooner Venona come sneaking into the Roads after dark, at 8.12.54 P.M. the same day nearly ten hours after the big white schooner and yet 4 hours, 45 minutes and 41 seconds inside of her allowance, which was 14 hours, 21 minutes and 4 seconds. So the race went to the forty-footer, and while Mr. Rainey must have been disappointed he could not have failed to have appreciated the performance of the gallant little craft which took the honors of the long jaunt. All in all it was a satisfactory contest.

While the present season has been attended by most remarkable enthusiasm so far as club regattas have been concerned, the ocean race to Bermuda held in June by the Brooklyn Yacht Club seemed to have exhausted the interest of racing yachtsmen in events of this kind. The Brooklyn Yacht Club indeed was the first to learn this when it attempted to hold its cruise to Jamestown, and found but two schooners at the line when the day for the start came, the result was that the project was abandoned.

The Connecticut yachtsmen did a bit better than this; for out of the twelve craft which were expected to enter, four were in readiness for the race when the day arrived. Following is a table of the contesting boats, their dimensions, owners and the like:

	L.W.L.	Beam	Draft	Rating
Invader	95	25.6	13.11	88
Endymion	103	24.0	12.9	76
Margaret	60	19	8.6	65
Venona	43	13	9.6	40

Owners—Invader, Roy A. Rainey, Jr.; Endymion, George Lauder, Jr.; Margaret, George S. Runk; Venona, Robert Olyphant.

The course was gamey in the extreme, lying from Greenwich up the Sound to and around Montauk Point upon the extreme end of Long Island, and thence down the coast to the finish. This gave about three hundred miles of open sea. In

VENONA. THE SMALLEST RACER IN THE THRESH TO JAMESTOWN.

addition to the four boats named, Commodore Morton F. Plant's Ingomar, L. J. Callanan's Eclipse, Gibson Putzel's Loyal were withdrawn the night before the race and the owners of the auxiliaries Mayflower, Seneca, Fleur de Lys, Lasca and Grampus did not take the trouble to say that they would not participate, and neither did they appear at the line. The race was delayed four hours in the hope that some of these boats might arrive later, but at two o'clock as there were still no more than the original four, the race was started. Any comment as to the injustice to the regatta committee by entrants who fail to live up to their expressed intentions, it might be added parenthetically would be so obvious as to render said comment unnecessary.

A STAUNCH TRIO—MARGARET, INVADER, ENDYMION

For a time it seemed as though that great black yacht Endymion, famous holder of transatlantic records, would also have to withdraw, her crew deserting at sunrise on the day of the race. However, Commodore Lauder took the situation by the horns and raked up a crew in South Brooklyn, sailing later in the day with only a captain and mate familiar with the schooner.

When the starting signal was flung to the breeze from the flagship Bellemere at 1.50 P.M. the yachts were all in the harbor and a light headwind gave them considerable trouble in making the line. Shortly before two o'clock, though, the wind shifted abeam, and the boats went over in good shape Endymion nicely berthed to windward of her three rivals in the lead. She crossed at 2.01.58, Invader followed at 2.02.28; Margaret at 2.03; Venona at 2.03.41. The small yachts all stood over toward the Long Island shore hunting for a better slant of wind from the southward which is usually to be found over there each afternoon in late summer, while Endymion and Invader held out in the middle of the Sound with the Lauder boat maintaining her lead. Invader came up with a freshening wind at three o'clock, however, and in fifteen minutes was leading the entire fleet. Venona passed Margaret off Lloyd's Point.

For the greater part of the distance the racers had winds that were light and fair. The wind gave them a reach from Greenwich to Montauk Point which they weathered at eight o'clock on Sunday morning. At this time the two leading boats were about eight miles apart. The course lay southwest to Cape Charles after rounding Montauk. On Sunday afternoon Invader ran into a nasty southeast squall in which the foresheet traveler buckled and had to be cut away. This made plenty of excitement, but the storm passed in an hour or so. On Monday morning the yachts bucked into heavy head seas. Invader still leading was then about one hundred and twenty-six miles southwest of Montauk and Captain Mathias took in the mainsail, sending the yacht under foresail and headsails for five hours.

Monday night and Tuesday there were light northerly winds and for six hours on Monday and Tuesday there was fog. Bellemere which accompanied the racers down the coast finished with Invader. The fact that all yachts finished on the same day speaks well for the manner in which they were navigated.

The Practical Story of the Gasolene Motor

IV—Cylinder Arrangements

By LEWIS KINGSLEY

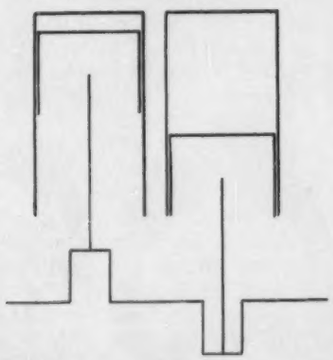
THE number of cylinders of a gasolene motor and their arrangement and positions are a matter of much importance. The question may be asked, "Why not make engines with only one cylinder, enlarging that cylinder when necessary to obtain greater power and thus maintaining the simplest construction?" It is true that single cylinder engines can be built in almost any size, up to many hundreds of horsepower; but the parts become large and heavy, the height of the engine increases so as to bring the center of gravity up to an impracticable height for marine work, the rotative speed is necessarily slow and the vibration great. Then there are other problems, connected with cooling and so forth, that are encountered in large cylinders but not in smaller ones. If, however, the engine is composed of a plurality of units, each doing part of the work, the various components will be just so much smaller and will present less difficulty in manufacture and use, the height of the engine will be kept down to the height of a single-cylinder engine, various complex engineering problems will be avoided and vibration reduced not only because the reciprocating parts are light, but also because they can be so arranged that they counterbalance one another. Vibration is also avoided by the division of the energy imparted to the crankshaft into a number of comparatively light impulses, occurring in succession, instead of a single heavy impulse equal to the sum of the lighter but more frequent ones.

The more impulses there are per revolution of the crankshaft, the greater will be the constancy of torque, or turning effort. Thus, in a four-cycle single cylinder engine the crankshaft will receive an impulse during half a revolution, or one stroke of the piston out of two revolutions or four strokes, and the fly-wheel keeps the shaft rotating and returns the energy necessary to perform the functions of exhaust, intake and compression during

the other three strokes. The action is necessarily somewhat jerky at low speeds especially; at high rotative rates the energy stored in the fly-wheel is so great as to carry the cycle through with practically no variation of speed, and vibration is less. In a two-cycle single cylinder engine, there being an impulse every revolution, the fly-wheel has only to carry the engine through the last half of the turn, or the second stroke of the piston. Consequently the vibration is less, other things being equal. This has had a great deal to do with the popularity of motors of this type for small powers.

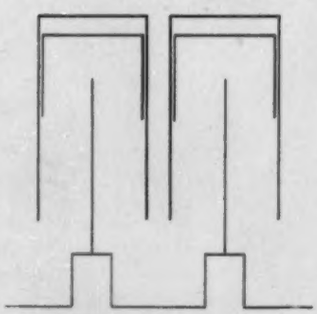
Suppose there is a sufficient number of cylinders to have the impulses given the crankshaft overlap—that is, before one explosion has expended its force another will have commenced, and taken up the work of turning the shaft. There will always be a turning effort or torque on the shaft, and an engine of this kind will run without a fly-wheel, though a steadier motion is usually obtained by the use of one.

In a two-cylinder two-cycle motor, the cranks are arranged differently from the cranks of a two-cylinder four-cycle engine. In the former, the cranks are set 180 degrees apart, or opposite, so that when one is at its lowest point the other is at its highest. Therefore, when one piston is descending on a power or impulse stroke, the other is ascending on the compression stroke. In the two-cylinder four-cycle engine, however, the cranks are set together, on the same side of the crankshaft and the pistons ascend and descend together, but the explosions occur alternately, first in one and then in the other cylinder. If the cranks were set opposite, as in the two-cycle engine with two cylinders, there would be two explosions on two successive strokes, then two idle strokes, then two more explosions and so on.



(1). TWO-CYLINDER TWO-CYCLE MOTOR WITH CRANKS OPPOSITE.

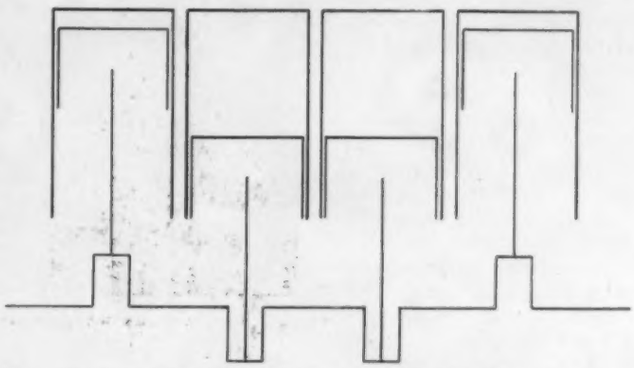
In three-cylinder engines, whether of the two-cycle or four-cycle type, the cranks are set at 120 degrees apart. With a two-cycle engine there is practically continuous torque when the engine is running, while with the four-cycle motor the impulses are effective for three-quarters of each revolution. For the sake of explanation we will consider that the full length of the power stroke is effective, disregarding the very early and the very late portions of the stroke when the angle made by the connecting rod and the crank is such that very little pressure is exerted on the latter. This of course holds good with all engines, regardless of the number of cylinders.



(2). TWO-CYLINDER FOUR-CYCLE MOTOR WITH CRANKS ON SAME SIDE OF SHAFT.

Four-cylinder engines of the four-cycle type have their cranks all in the same plane, set two on one side of the shaft and two on the other, 180 degrees apart. Usually the two end cranks will be found on one side and the two middle cranks opposite. Numbering the cylinders from one end, 1, 2, 3 and 4, the sequence of explosions is as follows: 1, 3, 2, 4, or 1, 2, 4 and 3. That is, first one of the end cylinders, then one of the middle cylinders, then the other end cylinder and lastly, the remaining intermediate. Thus there is no time, while the engine is running, when there is not pressure exerted except at the dead centers.

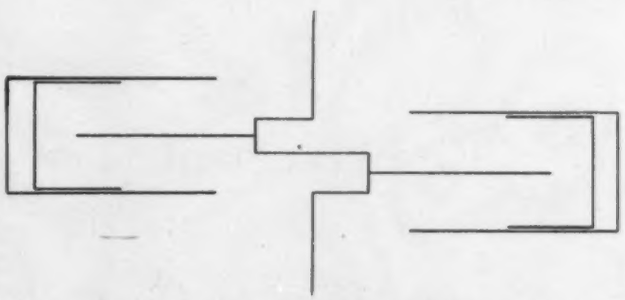
In the four-cylinder two-cycle motor the cranks are set quartering, or equally spaced at 90 degree intervals. One method of arranging them is to have two adjoining at 180 degrees and the other two at 180 degrees to each other but at 90 degrees, or right angles, to the first two. Obviously there are other possible methods, but this is a typical one. The firing order may be the same as in the four-cylinder four-cycle engine. As there are four explosions to occur while the shaft makes one revolution, there will be an impulse every quarter of a revolution, and as each impulse extends over nearly half a



(3). FOUR-CYLINDER FOUR-CYCLE MOTOR WITH CRANKS SET OPPOSITE.

revolution, there will be two pistons exerting pressure at all times except at the dead center intervals, when only one piston will be pushing.

While the vertical motor—that is, a motor in which the cylinders stand upright—is the usual type for marine work, motors with cylinders horizontally opposed are used to some extent and appear to be gaining in favor. A two-cylinder engine



(4). DOUBLE OPPOSED CYLINDER MOTOR WITH CRANKS SET OPPOSITE.

of this type has many good features. It is of course very low, and the weight is kept near the bottom of the boat, where it belongs. The balance, both of the impulses and of the reciprocating parts, is perfect. Engines of this type, whether working on the four-cycle or the two-cycle principle, have cranks set opposite, so that the pistons move toward the shaft and recede in unison, and the charges are ignited simultaneously in both cylinders. Thus the explosions, acting in opposite directions, balance each other, as do the pistons and connecting rods; any tendency toward vibration on the part of one set of moving parts is offset by an exactly similar tendency, but in the opposite direction, by the other set. The horizontal opposed motor with two cylinders has proved a very satisfactory form for four-cycle motors. Four-cylinder motors have also been built on

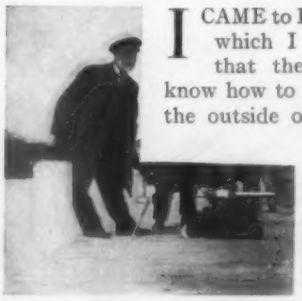
(Continued on page 302.)

A FLEET OF DETROIT CATBOATS WITH SHEETS EASED.

The Catboat Skippers of the Detroit River

THE MAN WHO HAS SNUFFED THE SALT GALE IS APT TO ... NY ILLUSIONS IN REGARD TO INLAND SAILORS AND THEIR CRAFT—A JOURNEY TO LAKE ERIE OR T... RIVER IS APT TO PROVE ILLUMINATING

By D. VICTOR BRONSON



I CAME to Detroit from the East with the idea which I suppose all Cape Codders have, that the only place where they really know how to sail catboats is in the lee or along the outside of that sickleshaped bar of sand. The average "old salt," who has never been West is quite apt to underestimate the extent of the seas which a lively young ocean like Lake Erie can kick up when its ambition is aroused, and while he might concede the ability of the inland skipper to sail "freaks," he would be slow to admit that anyone knew any more about catboats than himself.

My first disillusionment came in the form of a particularly unpleasant bit of nausea induced by a nasty chop at the meeting of the Detroit River and Lake Erie, the disagreeable features of which were accentuated by the unfeeling jeers of my western-bred shipmates. The second was the humiliating experience I underwent in the course of a little friendly brush on the Detroit River, of seeing a rival catboat which I felt I was outpointing and outfooting, slip inshore along the bank and show me a clean white stern in dim perspective.

So I wish in this article to give my friends in the East some idea of what they would find, were they to visit Detroit and the vicinity for a friendly hob-nob with the catboat skippers. Tons of paper have been used in exploiting rating and restrictions, so I shall not attempt to enter very strongly into these phases.

In the first place, the Detroit River is singularly fitted for small draught boats. There are numerous shoals, variable winds and shifting currents. The accessability of the city of Detroit is another strong factor in the popularity of the game. Five yacht clubs, a motor boat club and any number of canoe clubs within a radius of ten miles furnish pretty good circumstantial evidence. Despite the fact that the membership of the yacht clubs includes the owners and skippers of far larger craft, the universal popularity of the catboat is the distinguishing note. It is by no means an unusual sight to see some half hundred of them in the course of an afternoon's sail upon the Detroit River.

Of course the first idea for the present type came from the East. The old Sirrocco, a typical Cape cat from Massachusetts, was brought here in the early nineties by Dr. Otto Scherer and Dr. Ben Jacobs. The type will be familiar to all. She was 22 feet on the water line, 24 or 25 feet over all, with the big beam and shallow draught. Sirrocco went up in flames when the Detroit Boat Club was burned some six years ago. Of her type there are but very few on the Detroit River. The Aurora, a Crosby cat is the training school for the East Tawas youngsters upstream, and then there is Irene, the handsomest catboat on the river, owned by John Sweikart.

The Detroit Yacht Club was the first to adopt the one design class. About eleven years ago the late E. Brady Wendall drew up plans for a boat more or less of the sharpie or skipjack order, costing a trifle over $100, from which three boats were built. Shortly after, their neighbors, the Detroit Boat Club Yachtsmen, followed suit with three round bilged boats

A FOUL AT THE TURN—IN THE BIG CLASSES, WITH AS MANY AS THIRTY STARTERS, COLLISIONS ARE NOT INFREQUENT.

from the designs of "Billy" Dyer an enthusiastic amateur. These were burned in the same fire that consumed Sirrocco and were succeeded by others of like lines which are part of the present fleet. Each succeeding year has been marked by additions to the register of each of these two clubs, varying slightly in measurement and sail plan but retaining the same general features. In 1902, the Country Club located at Grosse Point decided to enter the yachting arena and a little later built four round-bilged cats costing about $280 each. The Solvay Yacht Club, an enthusiastic aggregation in another suburb of Detroit, were the next in line with some square-sided craft from a local builder, and this year the Edgemere Yacht Club, a young but flourishing organization, makes its initial bow with three new boats of strikingly good lines.

Up to the beginning of this season, the Detroit Yacht Club had walked away with the major portion of the honors, but down in Toledo is a chubby little dark man who wears a perpetual grin—Joe Grasser is his name—and designs catboats himself. Last year "Joe" came up from the Maumee River bringing with him three of the Toledo Yacht Club's cats and their skippers, among whom was a clerical looking individual by the name of Frank Frey. When the day was done and two of the Toledo boats had gone home with the cups offered by the Detroit Boat Club Yachtsmen, the solemn visage of Frank Frey was still solemner and the smile on the face of Joe Grasser was still brighter, but the local men had received a severe shock. As a result, the Detroit Yacht Club went into the market place and emerged this season with five new boats of Grasser design, with some few concessions to the ideas of the executive board.

SIRROCCO, THE PIONEER CATBOAT OF THE DETROIT RIVER.

It must be confessed that sightliness is not one of the characteristics of the Grasser cat. A long, hard, sharpie bilge, with little or no sheer, three or four inches of dead rise and a free-board so scanty as to favor tenderness are marked features. The new Edgemere boats differ in having still less dead rise, but a broader beam carried well forward gives an impression of good driving power. In spite of their scow-like bows, they are good weather boats and do not pound. In the first race of the season with something like thirty entries, the results could hardly be expected to give a satisfactory estimate of the comparative value of the different designs. Victory fell to the Detroit Boat Club yachtsmen who were represented by one of their last season's boats sailed by Doctor Aldrich, one of the cleverest cat boat skippers on the Lakes and Captain "Billy" Bewick as crew, who might be said to live, at least during the summer months, on board. Quite naturally the class subdivides unofficially, according to the design or date of building, but in order to give its guests a fair chance, the Detroit Yacht Club on this occasion assigned their different boats by lots instead of selecting the best skippers for the new boats. At this they took the next five positions after the leader, three of the boats being of the new Grasser design. The Edgemere boats did not make an especially good showing but as they were hardly in racing trim and as the breeze was not especially strong, it is hardly fair to judge them by this first performance. So much for the present status of the class. The measurements may be approximated by a glance at the universal rating and the

MAKING THE FIRST TURN.

pictures will supplement this scanty description. Now I should like to introduce to you some of the men who take as keen a delight in sailing a catboat as the boy, who for the first time finds himself in undisputed possession of the tiller of his own vessel.

Perhaps Ex-Commodore Otto Barthel of the Detroit Yacht Club might head the list of those to whom the catboat class owes much of its success. Year after year he has been a prominent figure at all races of the Interlake Yacht Racing Association where he has been an indefatigable worker. His suggestions have been of much practical value in the development of a speedy and safe type, and many a youngster has built and sailed, aided by his plans and council.

The present Detroit Yacht Club commodore, Herman T. Schmidt, owner and skipper of the 21-footer, Lipton Cup champion, Spray, finds almost as much fun in putting his skill to the test in the class with the little fellows as he does in sailing the crack of the Lakes. The other day I found him after a race in which he had been soundly whipped by his son, grinning broadly and very proud of his offspring.

Dave Lorimer is one of the skippers of which the Yacht Club is most proud. The walls of his home are well covered with flags, cups and decorations, which he has won. "The small one design class," says Skipper Lorimer, "puts it right up to the individual. Take two boats carrying 250 to 300 feet of canvas and, other things being equal, it's just as sporty a proposition as an international cup race. Another advantage with the smaller boat is that in less than an hour from the time you leave your office, you are on the river sailing, a thing which is impossible when there is a crew to collect and heavy canvas to handle."

But there are scores of Detroit Yacht Club members who can give any Cape Codder a good argument in catboat management, Charlie Sieder, secretary of the Club, and known from one end of the Lakes to the other, "Andy" Kramer, one of the liveliest of the skippers in spite of his gray hairs and paternal appearance, who has fired more starting guns than any other man in the City of Detroit and can talk by the hour on any kind of boat you choose to introduce, Bert Farr one of the wisest of the youngsters, Lingeman, Kendall and a host of others. There were one hundred and two entries for one of the club regattas last year just from its own membership.

A few hundred yards down the river are the beautiful quarters of the Detroit Boat Club. Here you will find Commodore John L. Dexter, owner of the Quest, father of the Detroit Boat Club, yachtsman and the hero of many a Put-In-Bay Regatta. His pride in the performance of the Club catboats is not mitigated one particle by the fact of his not racing himself.

Out at the Country Club, John Dyar strongly advocates long distance races lasting four or five hours to show the endurance qualities of the smaller craft in every point of sailing. The round-bilged boat although not apt to be so speedy is his choice for general club use.

Speaking of long distance work recalls some of the lengths to which the enthusiasm of the Detroit River catboat skippers have carried them. The run across Lake St. Clair to the Flats is a good twenty miles and has been made time and time again with the small craft well up to the front of the fleet. The tail end of the Galveston gale caught a big fleet of these boats in the middle of Lake St. Clair at the time of Detroit Sweepstakes (as the annual open races of the Detroit Yacht Club are called). Most of the fleet made for shore, but some of the catboats beat their way against the blast to the mouth of the river.

Port Huron a run of sixty miles, Toledo about sixty and Put-In-Bay an equal or greater distance have frequently been made by the intrepid skippers. Some idea of the sportsmanlike qualities of the inland yachtsmen may be gained from the statement that five members of the Detroit Yacht Club sailed the new catboats from Toledo to Detroit on a day that opened with a snow storm. One of the fleet capsized, but after a change of clothing the skipper resumed the helm in the boat, which had been righted meantime and bailed out, and finished the run.

DETROIT CATS MAKING THE FIRST TURN IN A BUNCH.

The Solvay and Edgemere Clubs being younger are of course not so well known. Solvay has a set of most capable executive officers, anyone of whom is well fitted to handle the four boats which belong to the organization. The Edgemere skippers are as yet untried as catboat racers, but as many of them are owners of small and very fast boats, it will not be long before they have to be reckoned with. Skipper Lou Weitz is one of the executive committee largely responsible for the installation of this new class, being built by John L. Hacker from plans furnished by the general opinion of the club of what's what in a boat.

As I look at the list of skippers in one of last year's races, I find almost every conceivable profession, age and religious belief represented—not that the latter would effect a man's sailing qualities, but it helps a man's "reasoning" power as Skipper Jack Rathbone terms the rakings over with which he is accustomed to brace up his crews. Just for example, running down the list, I find a doctor, a bank clerk, a real estate man, and so on through the entire gamut of life's activities.

Such is the personnel of the men who sail the catboats of the Detroit River, and I am quite sure that if any of the eastern yachtsmen will take the trouble to look in on them at their various quarters, he will feel that the spread of the yachting game in the West is in safe hands.

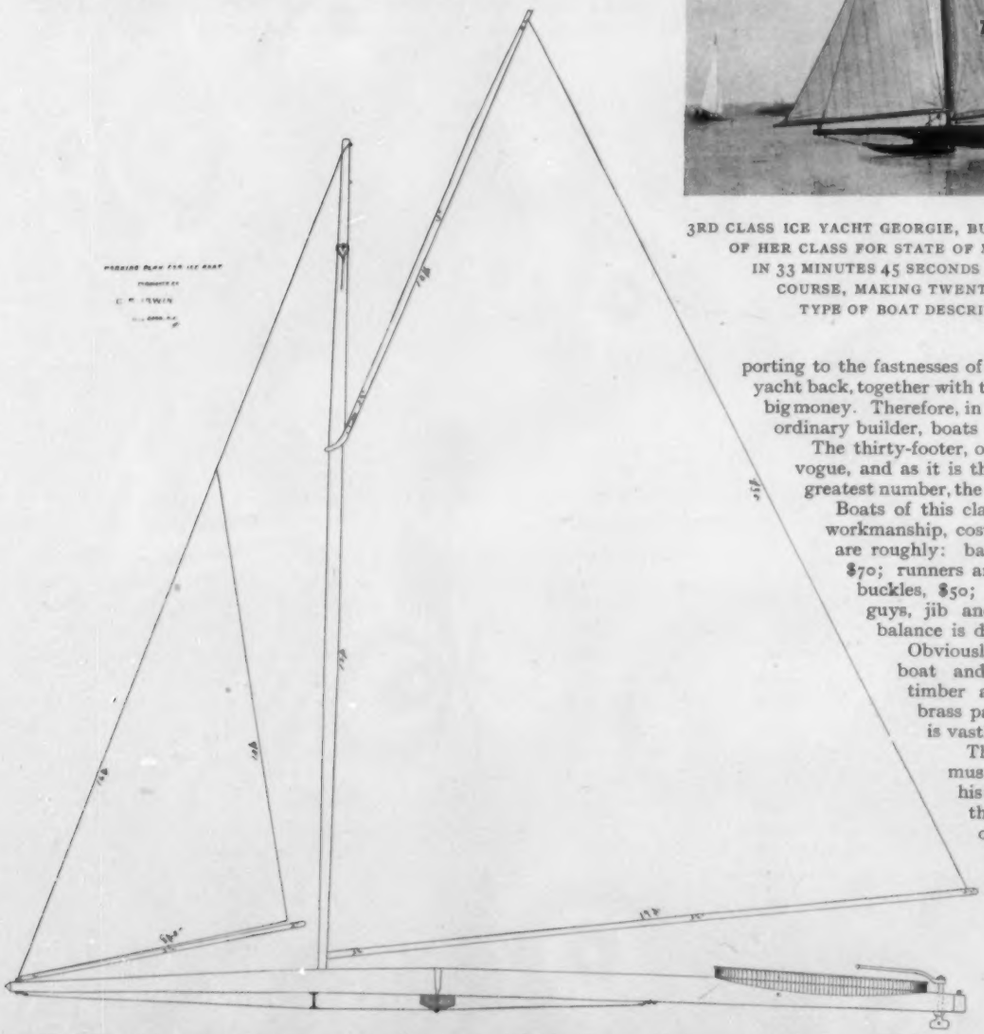
How to Build an Ice-Boat

By HENRY IRVING DODGE

Photographs by C. R. D. Foxwell

EVERYTHING about an ice boat must be light and tough—except the owner. There are not so many kinds of ice-boats as water craft. There is no comfortable cruising type. The ice-boat requires for its successful operation the most strenuous conditions, one of which is a half a gale with no suggestion of the zephyr to it. The man who handles the boat must be bundled up like an Esquimaux, which fact does not promote agility, but it saves his precious bones when he is bumped about or sent skidding over the ice as he is apt to be in case of collision. Most all ice-boats are racing machines pure and simple. Some are more so than others. Some are most so, for instance, Archibald Rogers' Jack Frost and John A. Roosevelt's Icicle—the great Poughkeepsie world beaters—the defenders of the championship trophy. For years the Shrewsbury men have coveted the pennant—and that's all. Jack Frost, Icicle and other up-Hudson boats are owned by veterans—pioneers in the sport—who spared neither time, skill nor money in their building. They are in a class by themselves. A prominent builder of Shrewsbury when asked what he would charge to make a craft that would have any show of capturing the championship trophy replied, "Three thousand dollars." By this he meant the cost of material, building, transporting to the fastnesses of the Hudson, racing, and bringing the yacht back, together with the crew. Ice yachts of this order mean big money. Therefore, in giving suggestions that may serve the ordinary builder, boats of this class need not be considered.

3RD CLASS ICE YACHT GEORGIE, BUILT IN 1884 AND STILL THE CHAMPION OF HER CLASS FOR STATE OF NEW JERSEY. SHE DID 20 MILES IN 33 MINUTES 45 SECONDS OVER A MEASURED TRIANGULAR COURSE, MAKING TWENTY-FOUR TURNS. THIS IS THE TYPE OF BOAT DESCRIBED IN ARTICLE AND PLANS.



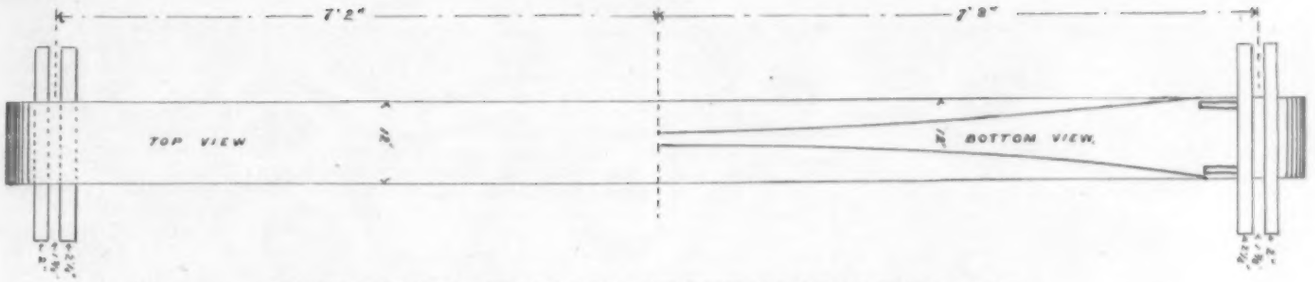
ELEVATION AND SAIL PLAN OF 3RD CLASS ICE YACHT FURNISHED BY C. P. IRWIN, RED BANK, N. J. THE BACKBONE IS 30 FEET LONG, THE MAST, BOOM AND GAFF ARE 19½ FEET, 19 FEET AND 13 FEET RESPECTIVELY. THE SAIL MEASURES 28 FEET FROM POINT OF GAFF TO POINT OF BOOM AND 15 FEET FROM THROAT OF GAFF TO THROAT OF BOOM. THE DIMENSIONS OF THE JIB ARE 16 FEET, 13 FEET AND 8 FEET.

The thirty-footer, or third class boat, is coming most into vogue, and as it is the purpose of YACHTING to serve the greatest number, the following remarks pertain to that class.

Boats of this class, of the first order of material and workmanship, cost in round numbers $500. The items are roughly: backbone and runner plank, $40; sails, $70; runners and rudder, $100; cock-pit, $25; turn buckles, $50; cringles and wire for shrouds, sideguys, jib and bobstays and the like, $15; the balance is due to labor and incidentals.

Obviously, where the owner builds his own boat and uses inferior, though serviceable timber and substitutes galvanized iron for brass parts, the expense of making the boat is vastly reduced. So is the boat's efficiency.

The would-be builder of the ice-boat must let "lightness and toughness" be his motto. He must remember also that any surface in the wrong position offers remarkable resistance to the wind. These considerations are all sufficient in the building of an ice-boat. A 30-foot backbone 5½ inches wide and 9½ inches deep would be heavy indeed. Therefore it is made to taper from a width of 4½ inches and a depth of 5 inches at the heel to a width of 5½ inches and a depth of 9½ inches at the point where it rests upon the runner plank, and where the greatest strain is borne, tapering down again to a width of 3 inches and a depth of 3½ inches



TOP VIEW OF HALF LENGTH OF RUNNER PLANK SHOWING CHOCKS AT END FOR RUNNER.

at the nose. The underside of the backbone is absolutely horizontal. It will be seen that by thus fashioning the backbone lightness is secured, windage avoided, and this at no sacrifice of strength. The necessity of obtaining well seasoned wood is quite obvious.

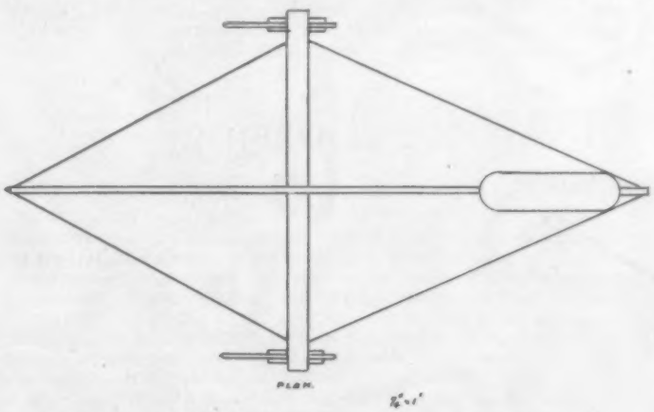
Bass wood, fir, Oregon spruce, white pine or any light wood that combines the aforesaid qualities of lightness and toughness is good for the backbone. For the runner plank much the same may be said. The more elastic it may be, the better. It is conceded that bass wood is the best material available in the East for this purpose. The spars, that is, mast, gaff and boom, should be made of spruce.

Edge of half length of runner plank showing section of backbone.

The runner board for a boat of this class should be 15 feet long between the cut of the runners, which would mean something more over all measurement. The runner board is 12 inches wide and tapers from a depth of 2½ inches at the ends to 5 inches at the center, the bottom being straight. This piece is formed like a truss, the under side being beveled to avoid weight and windage.

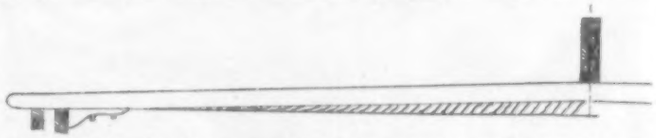
The backbone is fastened to the runner plank by a saddle of Norway iron, some 2 inches wide by ¼ inch thick, and having forged arms which pass through the runner plank and are fastened on the under side with nuts. The backbone having a tendency to forge ahead, it is a good plan to screw a chock on its under side, just aft of the runner plank, thus reinforcing the saddle. These great cross pieces are stayed by ¼ inch plow steel wire rope which leads from a ring over the nose of the backbone, and connects on either side with the runner plank by means of turn-buckles secured to angle irons fastened to the under side of the runner board by ½-inch lag screws. The guys connect the heel with the runner plank in the same way. Some yachtsmen place the angle irons about half way out from the center of the runner plank, while others fasten them very close to the ends, obviously securing a greater purchase.

The runners work between chocks at the ends of the runner plank. These chocks are some 2 feet 4 inches long and 5 inches deep. Obviously the greatest strain is on the lee runner, and, consequently, the highest

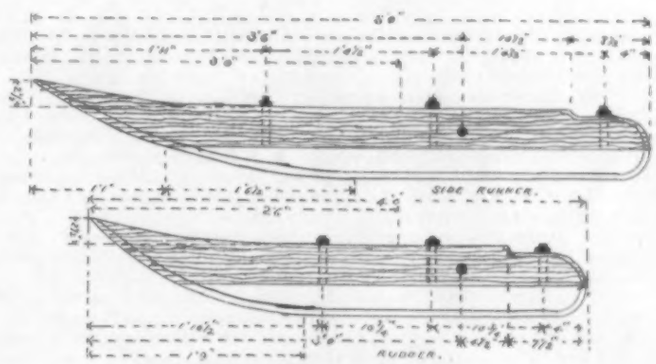


GROUND PLAN SHOWING BACKBONE, RUNNER PLANK AND COCKPIT.

pressure is on the inside chock. Accordingly, this is made 2¼ inches thick as compared with the 2-inch thickness of its fellow. It is sometimes wise to fortify the thicker chock by a triangular brace screwed to the runner plank. The chocks are fastened to the runner plank by bolts ⅝ inches by 7 inches. The center of the outside chock should be at least 5 inches from the end of the plank. Obviously, as the strain upon the runner is lateral, the bolts fastening the chocks should be as near the

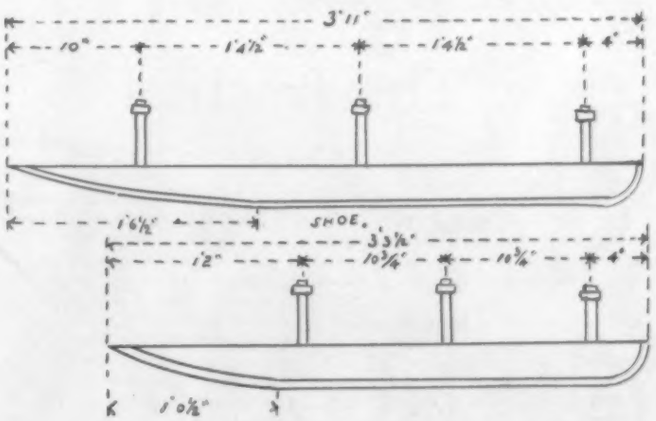


BOTTOM VIEW OF HALF LENGTH OF RUNNER PLANK SHOWING BEVEL AND BRACES FOR INSIDE CHOCK.

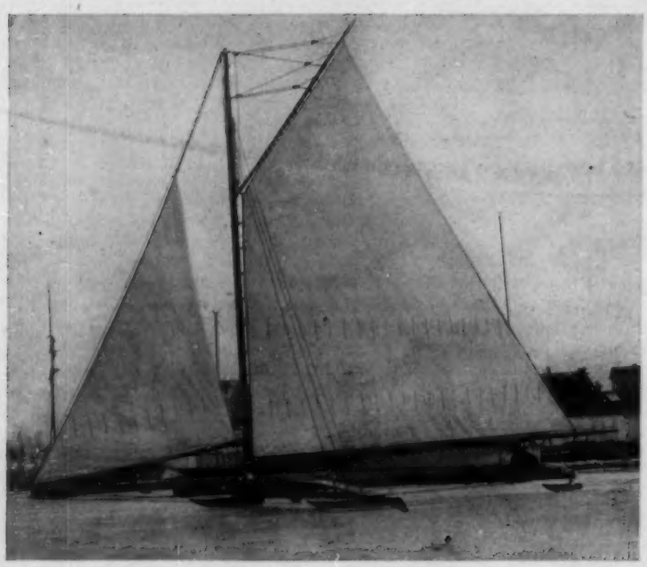


SIDE VIEW OF COMPLETE RUNNER.
SIDE VIEW OF RUDDER.

edge of the plank as possible—say, within 1½ inches. The runner, which is about 2 inches thick, fits snugly between these chocks, being fastened by a through bolt, but allowances must be made for a slight up and down or rocking motion. Too great stress may not be placed upon



RUNNER SHOE AND RUDDER SHOE.



1ST CLASS ICE YACHT. HAS A BACKBONE 50 FEET LONG.

the injunction not to allow the runners to wobble or have any lateral play, since in this case they would "spit" and gouge the ice and greatly retard the speed of the boat.

The runners are some 7 inches deep, including 3 inch shoes which are fastened to the wood by bolts. The shoes should be made of the best grade of cast iron, though not so hard as to defy the file. The rudder or steering runner may be 3½ feet long. It is held by a fork attached to the rudder post, and has a vertical as well as horizontal motion. Between the rudder and the heel of the backbone should be a buffer of rubber. A tiller some 3 feet 6 inches long will do.

The cockpit may be some 6 feet long and about half as wide. Bent oak strips 4 inches or 5 inches high are best for this purpose, and ½ inch oak flooring will answer.

For a boat of these dimensions the mast should be some 19½ feet high, the boom and gaff 19 feet and 13 feet respectively. The mast step should be of wrought iron, 2½ inches wide, 1½ inches deep, and ½ inch thick, and have a cast brass tenon to fit the mortise in the foot of the mast, which should be fortified by a band of brass. The mast which is stepped practically 3 feet 3 inches forward of the center of the runner plank, tapers from a thickness of 3½ inches at its heel to 4½ inches at the jaws of the gaff, the point of greatest strain. The greatest thickness of the boom, which also tapers both ways, would be practically that of the mast. The greatest strain upon the boom is at a point two-thirds of the distance out from the mast. The gaff would be 3 inches thick at the largest point. From an iron band at the mast head single shrouds of the same size as the side-guys depend and connect with the ends of the runner plank just inside the inner chock by turnbuckles.

Sails for boats of this class would best be 8 oz. high grade duck, closely woven. Such material is light and strong and the wind has little chance to sift through it. As a precautionary measure, two reefs, 3 feet and 6 feet away from the boom respectively, should be made in the mainsail. But the jib need have no reef, since when the larger sail is shortened the full area of the smaller is required for the maintenance of steerage way.

The running rigging should consist of ⅛ inch flexible steel wire rope, running through regular wire rope blocks. The end of the halyards should be spliced around brass thimbles, some 3 feet or 4 feet up from the step. A plain manilla rope passing several times through these thimbles and hollow cleats at the foot of the mast not only afford a purchase, but yield a certain elasticity which the wire halyard does not afford. The sails for a boat of this class would have an area of some 350 square feet. The jib is suspended from a stay running from the iron band at the mast head and connecting with the nose of the backbone by a turnbuckle.

It is not necessay to discuss the lateen rig. Some years ago it was believed that this great triangular sail, all in one piece, and swung on a wishbone mast, was an important innovation in ice yachting. Colonel E. Harrison Sanford built Avalanche—a 51-footer, with a beam half as great and a 30-foot spar—to try this type of sail. Avalanche carried 850 square feet of canvas. Having her sail in one piece she certainly economized wind, but the vast area with the necessary spars proved heavy and unwieldy. Presently Avalanche fell into disfavor with her owner, and from that time the use of the lateen rig has been gradually on the wane.

ICE YACHT WITH LATEEN SAIL. THIS RIG HAS PROVEN TOO UNWIELDY AND IS RAPIDLY GOING OUT OF VOGUE.

A very interesting class of ice craft is that known as mosquito. Boats of this class are about 15 feet long by 8 foot spread. They carry sail containing 125 square feet and under favorable conditions can make 20 miles an hour with a 150 pound man at the helm. A good boat of this class may be built for $75

Let it be understood that the cost of building ice yachts does not necessarily keep pace with increasing size. While such material as wire, duck (for sails) and the like has a fixed value per unit, the cost of the cross pieces increases out of all proportion. The timbering of a "mosquito" is of very common dimensions, being, say, 15 to 18 feet long, and easily obtainable, but a 30-foot piece of just the right quality for a backbone is rare and a 50-foot piece very much rarer. This is true also of the spars.

The Practical Side of Motor Boating

By HOWARD GREENE

THE motor boating season is over, so far as the North is concerned; boats are snugly laid up for the winter while their owners swap veracious yarns about thrilling races in which the teller of the story always won, and describe fearful gales weathered single-handed. But, however entertaining yarn-spinning may be, there is a good deal more profitable occupation to be found in doing the many little odd jobs about the boat and engine that are sure to be needed after a season's running. Every launchman, or at least the majority of the tribe, can remember promising himself, "Now, there's something I'll fix up when cold weather comes and the boat's laid up" or "I guess that'll do for just now; I'll make a proper job of it this winter." Now's the time to begin to make these improvements and repairs, for in the spring there'll be enough in the regular routine of getting the boat overboard without thinking of extras. If there are any new parts wanted, things that must be ordered from the factory at a distance, there is no time like the spring for not getting them on time. The manufacturers are busy, the express offices are busy, the railroads are busy—everyone who comes between the launchman and his source of supplies is doing a hurry business and has left everything to the last minute. And very likely the reader will do the very same thing, notwithstanding all this excellent advice. Well, there's nothing like learning by experience.

For getting at the engine it is very convenient to have a good strong bench of the right height on which to stand the machine, with a couple of blocks or a cradle to keep it upright, if necessary. If everything is solidly built, the engine may be bolted down to the blocking so it can be run for testing purposes. If this is done, there are two important precautions to be observed. Supply plenty of water for the cooling system. It is best to let the engine pump its own water, taking it from a bucket. Thus in testing, the conditions, so far as cooling is concerned, will be practically identical with ordinary running conditions. The second precaution will then be to pipe the exhaust out of the room, if the motor is to be run for any length of time, for not only are the fumes

painful to the eyes, especially if there is smoke in the exhaust, but the gases are capable of producing more serious effects, in extreme cases bringing on delirium and unconsciousness. Of course a short run can produce nothing worse than smarting eyes and a bad headache; but for prolonged tests the exhaust should be carried into the open air.

When taking the engine apart for cleaning, each small part—the piston, rings, and anything that will go into a bucket—should be soaked in kerosene to soften the old, gummy oil, all of which should be removed. There may be on the piston head, in the exhaust passages and on the walls and top of the combustion chamber deposits of hard carbon that will not come away so readily. In this case scraping must be adopted; but be careful not to mar the finished surfaces of the wearing parts. If there is the slightest doubt as to the proper way of putting back all the parts, they should be labeled or listed in some way, so that there will be no mistakes in the assembling. As each part is cleaned, put it in a box or

1. Some of the important parts. Piston, thrust bearing rings, piston rings, circulating pump, eccentric exhaust head and crankshaft bearing in crankcase and cover.

other safe place where it will not be lost or banged about; then it will be handy when wanted again.

Handle the piston rings with great care. They are made of cast iron, and though they have a certain amount of elasticity and spring, are at the same time very brittle and easily broken. Spring them open just barely enough to get them out of their grooves, and do not let them fly back with a snap when sliding them off the end of the piston. In inserting a piston, with rings in place, in its cylinder, start it very carefully so as not to batter the edges of the cylinder, piston or rings, and push in until the first ring is about to enter. Then close in the ring by pressing with the fingers on the edge furthest from the cylinder and push again until it enters, when it can be released and the next ring treated in the same way. If there is a shoulder in the cylinder at the end where the piston is inserted, or if, for any other reason, the rings cannot be entered in this way, use a number of strips of thin brass or tin, placing them between the piston and the larger part of the cylinder to close in the rings as the piston is pushed in. The smaller a ring is, within certain limits, the more troublesome it is likely to be.

When the rings are clean, examine them carefully for leakage. They should be polished and bright all over the outer circumference; places where gas gets by will be clearly indicated by dark marks where the ring has not been bearing on the cylinder wall. If rings are not in first class condition, or if there is doubt about their efficacy, new ones should be put in. They are not very expensive and may make a good deal of difference in the power developed by the engine.

A good precaution, if there are any valves, such as poppet valves, used in your engine (such as the inlet and exhaust of a four-cycle engine or the inlet to the crank chamber of a two-cycle engine), is to test them for leakage and, if the seating is not in perfect condition, make it so. Clean the valve and its seat thoroughly, washing with kerosene if necessary, and put on a very little "marking" made by mixing red lead with lubricating oil to about the consistency of thick cream. Turn the valve in its seat, under some pressure of the hand, and then take it out and look at it. If it is as it should be, there will be an unbroken band of a dark color, smooth and shiny, where the valve has rubbed against its seat. The width of the band may vary from just a thin line to the full width of the valve; but the important thing is that it should form an absolutely unbroken circle. If the ring is only a sixteenth of an inch wide the valve will not leak. If the bearing surface is not continuous, grinding is in order; if the valve is in very bad condition a light touching up with a fine file will help it and expedite the grinding process, but this should not be done by one who is green at the work. For grinding, mix lubricating oil with flour emery or pulverized glass till the mixture is about as thick as molasses, and put a little on the valve with the end of the finger, spreading it well. Put the valve on its seat and rotate it first one way and then the other, going, perhaps quarter or half a turn each way, and lifting the valve from its seat every half dozen strokes or so. This lifting prevents the abrasive powder and the particles of metal from collecting in spots and cutting little grooves in the valves and seat, and also keeps the emery cool. Keep the valves going round and round by giving it an extra twist in the same direction occasionally, so that the grinding will be even all round. Do not let the surfaces run dry, and do not put on a heavy pressure; in both cases grooves will be ground into valve and seating. After a few dozen strokes wipe off the oil and emery thoroughly, put on some marking and try the valve. It may be that only a very light grinding was necessary, and that the valve will now be tight, with a complete bearing ring. Further grinding would only take off unnecessary metal.

2. The moving parts of a single cylinder, two-cycle, gasolene engine. Piston, connecting rod and crankshaft connected up, and one bearing, grease cup and the pump eccentric in place. Ball thrust bearing on lift.

Take pains to prevent emery or whatever is used from getting into the cylinder, where it is apt to stay and make a lot of trouble next summer. Plug the opening below the valve with a piece of clean waste or the like, and when the grinding is finished, pull this carefully out and wash all the parts thoroughly with gasolene, giving the newly ground surfaces a good hard rubbing with a bit of rag or waste. If it can be readily obtained, it might be well to use a pulverized flint, made for the purpose, which, though it does not cut quite as fast as either emery or glass, answers the purpose very well and any particles that may get into the cylinder are burned by the heat of the first explosions and rendered harmless. Do not forget that when a valve is ground the effective length of its stem is increased because of the metal removed. This may be sufficient to affect the timing, and make the valve open too soon and not close quickly enough. Note the clearance between the end of the stem and the cam or push-rod before grinding, and when the work is finished, file a little off the end of the stem, if necessary, to restore the normal condition. But do all this very carefully.

In a two-cycle engine a great deal depends upon the tightness of the crankcase, in which the charge of gas is compressed previous to being admitted to the cylinder above the piston. This tightness, in turn, is dependent to a very large extent upon the fit of the crankshaft in its bearings. Of course if there is leakage past the piston there will be an escape of burning gas from the cylinder into the crankcase rather than leakage the other way, the pressure of the expanding gas being much the greater; and the crankcase gas may even be ignited in this way. From loose crankshaft bearings, however, fresh gas will escape, and the running of the engine may be greatly impaired in this way. There should be some means of closing up this space. Whether it means a new set of bushings or merely a closing up of the worn brasses, the work should be done and the bearings made as tight as possible. There are engines on the market with self-adjusting packing which prevents gas leakage here regardless of the wear of the bearings. In such engines it will be necessary only to consider the bearing as a bearing, and not as a joint.

Remember that the connecting rod bearings, at both ends, should be examined for wear. The little end, which oscillates on the piston pin and is usually a solid bushing, may not be worn sufficiently to require renewal, which is the usual method of restoring this part to its normal condition. If it is very loose, however, it is not a serious matter to insert a new bushing. If it is a split bearing, with a pinching screw at one side, the adjustment is of course a simple matter. The big end, carrying the crankpin bearing, is always split for the obvious reason that the bearing could not otherwise be put on the crankpin; and the split gives the feature of adjustability. Take up the bearing in whatever way the maker has provided, fitting it so closely to the crankpin that there will be no perceptible play (apart from a slight endwise shake) and no binding, but a free, easy movement.

Another thing to bear in mind is that in going over the bearings, examine them all to see if there is any indication of "cutting," caused by some foreign substance getting between the surfaces or by the absence of lubrication. If there are signs of bearings having run dry, and you are sure that the matter of lubrication has not been neglected in any way, pay particular attention to the oiling system when you come to it, and try to make sure that the flow of oil to that particular part will be ample and uninterrupted. If a bearing which is to be used again, is rough and scratched up, it should be made quite smooth and perfect, as should also the surface of the crankpin. The latter may require a little lathe work. The former may then be fitted by scraping, using a little red lead and oil for marking. This cannot well be done if the bearing is very badly scored; in such a case it should either be given a light cut in the lathe or else replaced by new brasses.

What the America's Cup Stands For

LONDON, Oct. 7, 1907

JUDGING from what appears in the newspapers here in the shape of editorial comments, and taking another line through the cabled extracts from the American press, the New York Yacht Club has done a most unpopular thing in declining Sir Thomas Lipton's fourth challenge for the Cup. Of course, I am not to be taken as one who gladly admits that Americans are the very best sportsmen on earth. My fixed opinion is, on the contrary, that Americans are middling losers, and very bad winners. The fault is perhaps that they talk too much about what they do, but it is a fault nevertheless. Having said this, however, I proceed formally to take the unpopular side with the New York Yacht Club. The Royal Irish challenge was not one which could have been accepted by anybody whose appreciation of the object of the donors of the America Cup, was true.

I have said before that the America's Cup ought only to be raced for by the fastest yachts, irrespectively of their accommodation for passengers, or crew. It is a prize for time speed, not a prize for the fastest yacht designed within certain limits. The first deed of gift purposely gave designers the freest possible hand, and if the men who donated the Cup did not know what they were doing—that evidently is the modern view—the trophy ought to be withdrawn. Nobody has a right to say that this ought to be done, or that ought to be done. The original intention was to put up a trophy to be won and held by the fastest yacht in the world, and stripped of its verbiage, and its minor technicalities, it is that intention which Mr. Pierpont Morgan and his colleagues have respected.

Against this view it may be urged that the use of the word "yacht" implies certain obvious things. To a certain extent it does, but it does not imply that the America Cup yacht is to be certified to accommodate so many passengers in as nearly as possible the luxury of the Waldorf Astoria. Nor does it imply that she must not be deeper than so many feet, or longer at the ends than so many more feet. It merely implies that within certain water line limits a designer is to design something in the shape of a yacht to perform the functions of a yacht, so far as speed through the water is concerned. To argue that this is not the case is just as if one contended that Derby candidates should have many of the qualities of the useful cart-horse.

Another objection urged against my unpopular view is that our International rule, and your Universal rule represent the collective opinion of yachting, and that the New York Yacht Club ought to defer to it. Objectors along this line, however, miss the whole point. Neither our rule, nor your rule, is a speed rule at all. Each of them has been made in the interest of people who wish vessels to use as well as to race. They want something moderately cheap which will last a fairly long time, and not be outclassed too soon. The difficulty they had to contend against was that some millionaire was always outbuilding them, and it was to protect themselves against these millionaires and against each other that these new rules were formulated. It is easy to see why designers on both sides of the Atlantic elected to facilitate this end. There is more business in yachting when restrictions are placed on millionaire sportsmen. But the America Cup has nothing to do with business, and it is outside the concern of people who wish to live and bring up families on their racing yachts. It stands for speed pure and simple, and I hope it will continue to stand for speed until the end of time.

A great deal has been said about freaks lately, and at much of it I incline to smile. No doubt some of the later challengers and defenders were freaks in the sense that the stuff of which they were made had no "heart of oak" quality about it. To get lightness with strength, alloys were used, which metallurgists knew could not last for long. As a matter of fact they did not last for long. Be it noted, however, that there was nothing freakish about their design of the yachts. The talk about freak designs, is in fact, pure nonsense, as anybody may judge who can look at the models of cup boats since 1893. I saw a good old so-called freak in Brightlingsea Creek last week. Her name is "Navahoe," and she is just as good as the day she left Herreshoff's. I saw another last month waiting to be taken to her mud berth in the Medina. This was "Britannia." "Britannia" never strained appreciably, never leaked, and never gave the least trouble in all the years of her racing. In fact John Carter told me the other day that apart from canvas the cost of making her as good as ever she was would be comparatively slight.

When we get to talk about the material of which Cup boats are made nowadays, we get very nearly to the cause of all the complaining about freak yachts. The metals of which the modern yachts are built cost a lot of money, and after a year they are no more valuable than scrap. That, in fact, is where the shoe pinches. What the modern challenger would like to do is to challenge with a boat like "Britannia," which he could sell for very nearly her original cost at the close of the races. He is prevented from doing that by your millionaires, who, advised no doubt by the astute Mr. Herreshoff, spend no end of money in the production of yachts calculated to do just what is required of them. The defense of the Cup is a matter of money with you, and if anybody wishes to take it from you, its capture must also be a matter of money. If I had money you would see the ideal Tea Tray on your side without much loss of time, and if it won the Cup I am sure you would not hear a whisper of "freak" in this part of the world at any rate.

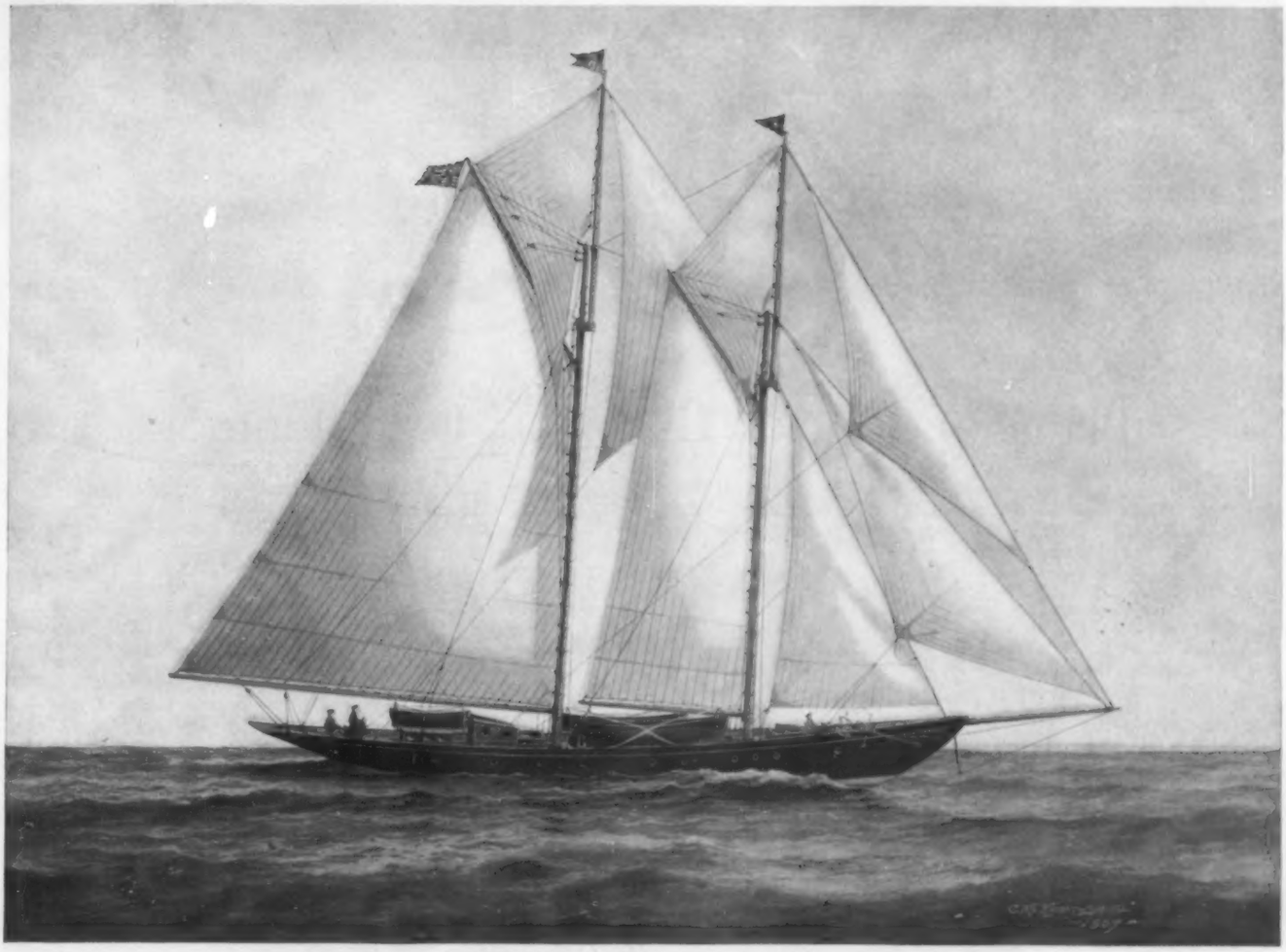
The inference is not to be drawn from all this that I am in any way antagonistic to Sir Thomas Lipton. The fact is, on the contrary, that I count the genial baronet one of my best friends. It would be a most unfriendly act of mine, however, to agree with him in the view he takes, because in the bottom of my heart I feel that he is wrong. Of course, the cost of challenging for the America Cup is not inconsiderable, and the expenditure is non-productive in the sense that the yacht herself becomes of merely scrap value immediately the race is over. But nobody is justified in running away with the idea that it is the cost that deters Sir Thomas Lipton. Sir Thomas would dump down his last shilling tomorrow, I believe, if it was to be the means of lifting the Cup.

His advisers are the people who desire to race with smaller boats under the new rule, and Sir Thomas' only reason for liking the idea is that if it were acceptable to America, he would be able to build two challengers. One of these would be designed by Mr. Fife, and the other by Mr. Mylne, and the best would be the challenger. Whether the best would be the winner of the Cup is not for me to say, but I imagine, taking a line through "Avenger," and some other of your newer boats, that Mr. Herreshoff knows as much about your new rule as Mr. Fife does about ours. If that be the case, a certain conclusion is inevitable, which I need not formally draw. The plain truth is, if some of us would only open our eyes to it, that not in restriction, but in absolute freedom of design is our only earthly chance of success. If there be any genius in British yacht architecture, it ought to have the courage of its genius, instead of entrenching itself behind new rules.

For some time previously to the New York Yacht Club's rejection of the Royal Irish Challenge, the talk was of who was to be the skipper of the challenger. If a Mylne boat were the ultimate choice, the feeling was that Stephen Barbrook, of Tollesbury, must be the choice, as "Steve" has done better with Mylne boats than any other skipper. He has never done any big racing on this side, but he did very well with poor Tom Jay on the Deerhound, and subsequently on Satanita. His inexperience might be against him, but you never can tell. If, on the other hand, the choice were a Fife boat, the opinion was that "form" unmistakably pointed to Charles Bevis of Swanwick, who was over in America in 1903 with "Shamrock I." The trial races of that year represent the whole of his American experience, but even if he had never been on your side, this is the man for my money. "Bob" Wringe feels that it was not his fault that "Shamrock III" was so much slower than "Reliance." His estimate is that she was twenty-five minutes slower on a thirty-mile course than "Reliance," although Bevis who has a good eye in his head, puts the difference at as much as thirty-five minutes. Wringe thinks, therefore, that the next boat is due to him if she has any chance of success, because he is very jealous of his reputation in the eyes of Americans, whom he learned to respect when he was in charge of "Mineola." Wringe or Bevis is my selection for the skippership of the next challenger, no matter who designs her, with Edward Sycamore as a not too remote outsider.

The inclination is to take the reported Swedish Challenge lightly, and I am not sure that it is a mistake to do so. My reason for this thought is that the necessary money is not in Swedish yachting. That may be a harsh thing to say, but it is a fact. Millionaire yachtsmen are few and far between in Sweden, and they are plentiful enough when you come to reap them in America. Do not let anybody run away with the idea that an America Cup challenger of some account could not be built in Northern Europe. I saw several of the Scandinavian designers at the International Conference here not long ago, and I was greatly impressed by their braininess. They could, undoubtedly, design a fast boat if the money were plentiful enough for a serious challenge. Of course, their ideas are not strikingly original, although you can never tell where the mastery of a knowledge of anything—even the designing of yachts—will lead. Dan Aldridge, for instance, who was skipper of the German yacht which lost the Coupe de France this year, amazed me the other day with his description of the French boat which defeated him. "Ahr Men" was, he said, French designed, but actually she was as much a Herreshoff boat as "Sonya." She had American spars, and Ratsey and Lapthorne sails. There was nothing to choose, he explained, between the two boats off the wind, but turning to windward, the French boat beat him eleven minutes in ten miles. There was not the suspicion of a fluke in it all, and he had not a word to say. Now, that is not a bad start for French yacht designing, even though the root idea is American, and if you ask me, there is trouble brewing for all of us in the republic across the English Channel. Ten years ago, nobody would have taken a French yacht manned by Frenchmen seriously. How different the case is now, this evidence of Aldridge's goes to show.

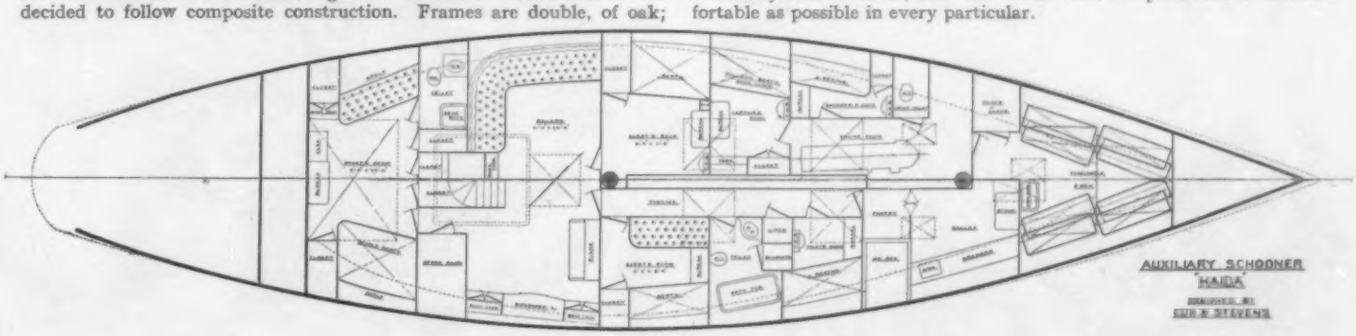
ROBERT MACINTYRE.



THE AUXILIARY SCHOONER YACHT, HAIDA.

Plans of the New Auxiliary Schooner Yacht, Haida

THE auxiliary schooner yacht, Haida, shown in the accompanying plans and illustrations, was designed by Cox & Stevens for Max C. Fleischman of Cincinnati. The construction of the vessel is well advanced at the yard of her builders, the date of delivery being January 1st, 1908. The design shows a comfortable and able cruising vessel with fair turn of speed under sail and with an improved speedway engine of 200 horsepower to show over nine knots under power; the dimensions being 105 feet over all; beam 24 feet; draft, 5 feet 6 inches. Gasolene tank will hold enough to go 1000 miles under power. Haida is to be used mainly in Southern waters and on hunting and fishing trips by Mr. Fleischman. The construction of the vessel is substantial and the scantlings are all heavy, the idea being to build a very strong and staunch craft capable of making extended hunting and fishing trips in Southern and South American waters. To secure the strength in the shallow broad hull it was decided to follow composite construction. Frames are double, of oak; the planking, yellow pine. The deck beams, sheer strake, deck stringers are of steel. The accommodation plan shows unusually comfortable quarters for a vessel of this size. The saloon is large and fitted with extension table, sideboard, sofa, piano, etc. The owner's room and bath are on the starboard side, and two guest rooms and bath on the port side of centerboard trunk. The crew consists of captain, engineer, four sailors, cook and messman. The outfit of boats consists of a fast 20-foot motor launch, a cutter and a dinghy. The quarters are lighted by electricity and heated by hot water. Being intended for Southern cruising, special attention has been paid to ventilation and all openings are screened to keep out mosquitoes and flies. The finish in the quarters will be generally Colonial, white with mahogany furniture. The owner's room, however, will be finished entirely in hardwood. All the upholstery is to be extremely rich in effect, and the vessel when complete will be as comfortable as possible in every particular.



PROFILE VIEW OF ILDICO III.

Plans of Ildico III—A 45-Foot Launch

ILDICO III was built in the autumn of 1906 by Mr. Charles Henry Davis of New York for use about South Yarmouth, Mass., as a day boat and tender for his racing sloops Atilla and Hun. The plans are from the office of Morgan Barney.

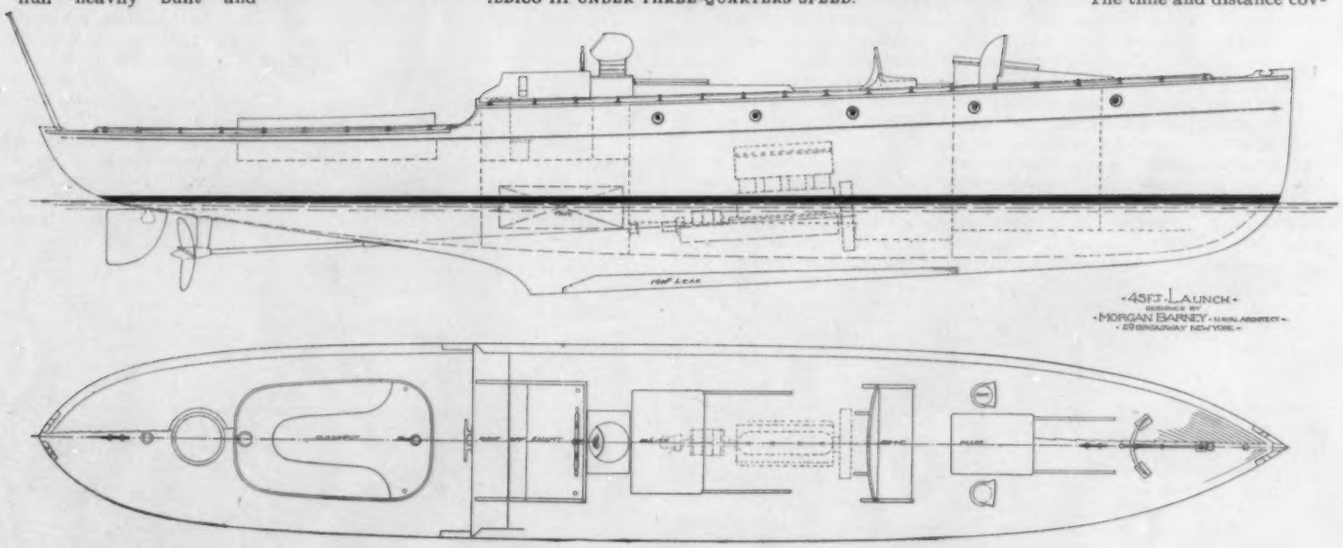
The hull is of the raised freeboard type first seen some years ago in Ildico II, also designed by Mr. Barney for Mr. Davis. The over all length is 45 feet, the beam 7 feet, and the draft 3 feet 3 inches. Forward, under the flush deck, is a small cabin. The machinery is located amidships; just aft of this is a steering cockpit or bridge. There is a large cockpit at the stern. The planking is of white cedar and yellow pine, copper fastened. The finish, including coamings, planksheer and hatches, is of mahogany. Both cockpits are water-tight and self bailing. The hull was built by H. Manley Crosby at Osterville, Mass.

Ildico III was designed to fulfill the special requirements of the locality in which she was to be used. High freeboard forward was necessary to meet the short high seas caused by the strong tides and wind sweeping across Vineyard and Nantucket Sounds. To provide for towing in rough water a slow speed engine was used and the beam was limited. The underwater body is relatively deep and the hull heavily built and ballasted with outside lead, making a smoothly driven boat in a head sea, with a reserve of weight and power for handling a tow.

The engine, which is a 25 horsepower, is fitted with a 30-inch fly-wheel the size ordinarily used on the 50 horsepower engine. This, of itself, gives great steadiness to the operation of the engine, and has proved most satisfactory. Furthermore, the engine bed is heavy and connected by cross floors and bolts to the lead keel which weighs 1400 pounds. The engine is fastened to this bed by special ⅞-inch bolts instead of the usual ½-inch lag screws, the result of all this is that the vibration is reduced to a minimum. The gasolene tank and the engine are in separate water-tight compartments bulkheaded off from the rest of the hull. The tank is below the water line and the fuel is pumped to a five gallon auxiliary tank in the engine room and flows from this by gravity to the vaporizer.

Tests made by Mr. Davis to determine the relative fuel consumption at different speeds are interesting. A four-mile course was measured from the chart and at the beginning of the test the five-gallon tank in the engine room was completely filled. The yacht was then run over this course at half speed until the auxiliary tank was emptied and the engine stopped. The time and distance cov-

ILDICO III UNDER THREE-QUARTERS SPEED.

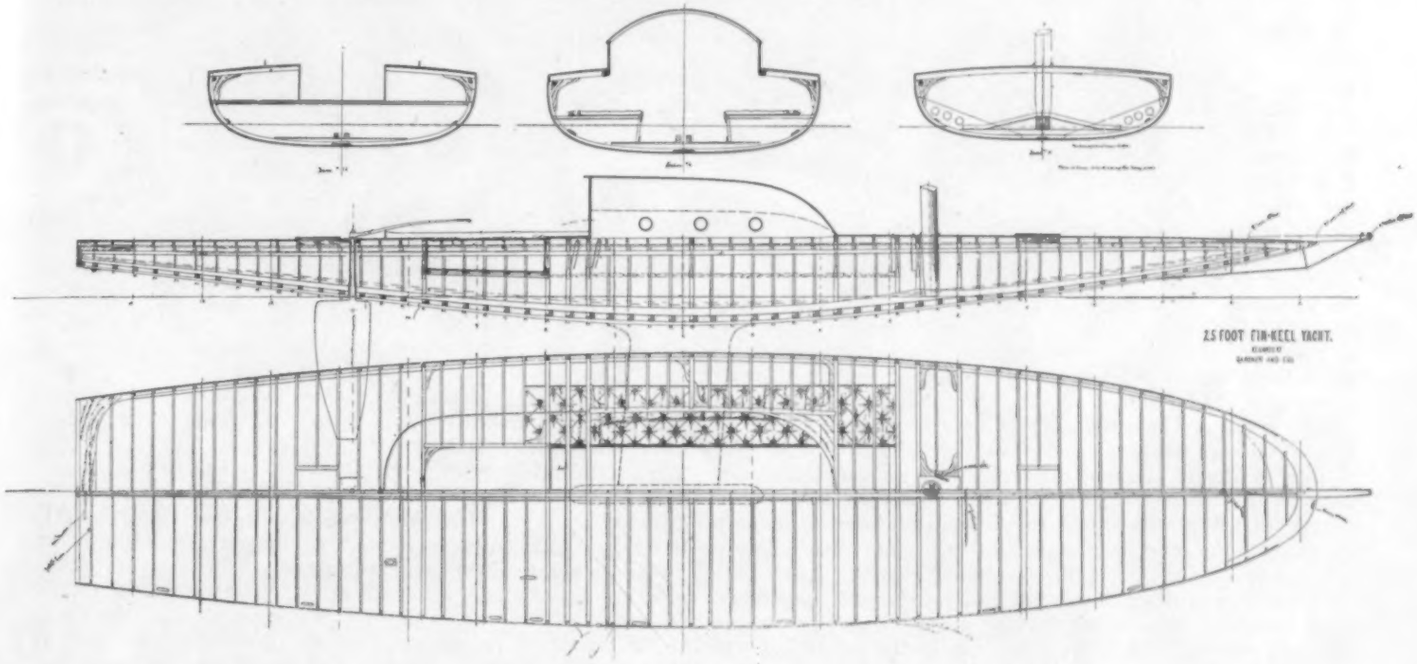


ered were recorded. A second run was made at approximately full speed under the same conditions with the same amount of gasolene. In the first run 21.46 miles were covered before the gasolene was exhausted. The speed averaged 8.44 miles per hour; the engine making 251 revolutions per minute. On the second run 13.81 miles were covered at an average of 10.56 miles per hour and with 351 revolutions of the engine. The horsepower developed on the first run was approximately 8.68 and on the second 23.63. These figures were derived from data obtained from a brake test made by Mr. Barney before the engine was shipped from the manufacturers. In this brake test, the engine was first run at full lead and then throttled down in successive steps and the corresponding brake horsepower and revolutions recorded. The horsepower on the trials was calculated as being proportional to the nearest corresponding revolutions and horsepower shown in the brake tests, an assumption not theoretically correct but sufficiently accurate for the purpose.

These trials showed a consumption of 1.87 pints of gasolene per mile at the lower, as against 2.89 pints at the higher speed. In other words, there was an increase of 55 per cent in fuel consumption for an increase of 25 per cent in speed, notwithstanding the fact that at the higher speed the engine showed an increase in economy of 40 per cent.

Under more favorable conditions in deep water the boat makes from eleven to twelve miles per hour. On the course in question the water was shoal, varying from nine feet to twenty feet and no allowance was made for the time or distance lost in making the frequent turns.

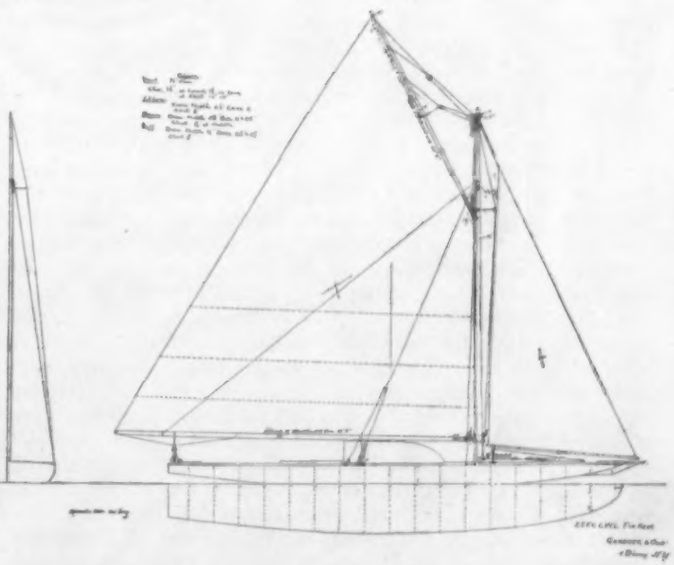
Tests such as the above will become of great value in the designing of vessels using gasolene for motive power, especially in view of the increasing cost of fuel. Their study must eventually result in radical improvements in both hull and engine design and the intelligent combination of these two elements will go far toward producing a fast, economical and seaworthy vessel.



Plans of Cartoon

CARTOON was built for Howard Parker of the Corinthian Yacht Club of Boston. She was one of the first of extreme scow type, and was very much the largest boat of that type when built. She proved an exceptionally fast boat in a breeze, and often logged over twelve knots on a reach. She practically won everything for two seasons in Boston waters. She pounded quite badly in moderate wind and heavy sea, but in strong winds proved a very good sea boat. She made quite a famous run from Boston to New York, in heavy weather, the latter part of December, 1900. For over half the distance she was traveling at a speed of eleven knots, and at times was almost entirely under water. She arrived, however, at City Island without any damage whatever from her trip. Her dimensions follow: Length over all, 47 feet; length water line, 25 feet; beam, 10 feet; draft, 7 feet 6 inches; sail area, 1,060 square feet.

Cartoon was really the idea of Mr. Parker carefully carried out by the designer. She was built under a rule designed to combine the wholesome type with speed qualities. The rules called for a certain amount of head room between the cabin roof and floor. This meant where the roof was low and flat, a correspondingly depressed floor. It was found inconvenient to build her this way, and the objection was circumvented by raising the floor and making the cabin roof very high. But this was found to be an obstruction as it caught the wind and retarded the progress of the boat, and was overcome by constructing it on the quarter egg shape plan. The yacht was built of double plank mahogany. The success of Cartoon was so eminent that Mr. Parker's idea bore a very gratifying fruitage in the neighborhood of Boston where she had raced, other boats being built of the same type. The irony of destiny was illustrated in the way in which this remarkable craft met with her death: She was being taken to Wood's shipyard at City Island, where she was built, for repairs, when a sudden squall dashed her against the wall of the yard and destroyed her.



EDITORIAL

Published by the Yachting Publishing Co.; Oswald Garrison Villard, President; Robert M. McBride, Secretary and Treasurer.,

Sir Thomas Lipton's Challenge for the America's Cup

The New York Yacht Club has decided the question whether it shall throw its influence in favor of the racing machine pure and simple or on the side of a sane racing boat with some of the attributes of a cruiser, by voting for the freak. This is first of all the meaning of its decision to reject Sir Thomas Lipton's challenge for a race for the America's Cup in 1908. It has formally decided that speed is the one and only object the donors of the Cup had in view. The men who built and raced America are credited with the desire to incite designers to the production of the abnormal, the unnatural and the useless save for one specific purpose. It matters not that the donors never dreamed of the peculiar genius of a Herreshoff and of million-dollar expenditures for one series of races. It is of no importance that there might arise another genius who will out-Herreshoff Herreshoff in his ability to produce a craft of ungainly body that shall tear through the water at even greater speeds. These things the Club seems not to have considered. Hence it has fallen back on the "dignity of the Cup," thrown overboard the new rules which were the outgrowth of national disgust with freak racing, and insists that if anybody challenges he shall do so under the old rules. These are not only injurious to the sport as a whole, but even place the challenger who has to cross the seas at a grave disadvantage.

With this position YACHTING has no sympathy whatever. At the weakness with which the Club presented its own case we can only marvel. That it represents correctly the majority of sailor-men in its own membership or in the country at large we cannot believe. We give to our readers elsewhere in this issue the best defense of the Club's action which we have yet seen, as proof of our readiness to give both sides a hearing. It is from our brilliant English correspondent. If the New York Yacht Club had had at its service a pen similarly skilled it would not today be in quite the deplorable position it occupies. It could at least have made a really forceful presentation of its decision that the America's Cup is to be competed for only by freaks. For this we must call them despite Mr. MacIntyre's objections. If this position is maintained there will either be no more races for this particular trophy or there will be a renewed struggle between mere racing machines, with fresh demand upon the designers for speed first and last no matter what the cost. But the weakness of our correspondent's position is that he overlooks the effect of such contests upon the sport as a whole, upon the small boat with which the amateur cruises in the Sound or on the Lakes, and in which he steals seaward when he dares. Everyone on this side of the ocean knows that Columbia and Reliance were imitated by a fleet of small craft whose ponderous overhangs and heavy fins made them dangerous boats for our young sailors to thrash around in and in fact sent them scurrying home whenever the wind freshened. If it were merely a question of a group of New York millionaires and an Irish baronet going off by themselves to see which designer by some *tour de force* could turn out the fastest machine, no matter how frail or how extreme or how abnormal, the situation would be different. But the New York Yacht Club cannot close its eyes to the effect of the America's races upon American yachting. Its severest critics have not accused it of failure to appreciate its own importance or of any undue modesty as to the position it occupies in our yachting world. Mr. MacIntyre, at least, declares for a machine in preference to a boat with delightful frankness. The New York Yacht Club deemed it wise to give other reasons also, and by doing so laid itself open to severe criticisms that beyond all doubt went home. There is the question of dignity. It would not oblige Sir Thomas, because he challenged not with a 90-footer but with a 68-rater, which would have had a racing length of something very close to 75 feet only ten feet less than such boats as Thistle and Vigilant and Genesta. As was asked in the public press, at precisely what length is the dignity of the Cup impaired, at 79 or 80 or 81 or 82 feet? The exact figure ought to be available for the benefit of any would-be challenger either in England or Germany, France or Sweden. Dignity? That which counts in a matter like this is not a dog-in-the-manger policy but one of cordial receptiveness. The spirit in which the contest is carried on is what tells. If it is the right kind, dignity will take care of itself. That our spirit has not always been deemed highly sportsmanlike Mr. MacIntyre's frank criticism again proves. What people who have the sport at heart would like to see is a different attitude in the handsome building on 44th Street—an attitude of readiness not to place obstacles in the way of international racing but to remove them. Press and public want proof that the New York Yacht Club thinks less about its dignity, its wealth and its social influence than it does about the growth and betterment of American yachting. Until that proof is forthcoming—which it may be in the answer to the Swedish challenge still unpublished as we go to press—the country at large will but gape and stare at the sight of our oldest yacht club refusing to accept an English challenge under the new rules which all our designers and yachtsmen have hailed as a welcome relief from those that made the Reliance a possibility.

That English opinion is by no means on the side of Mr. MacIntyre and of the Club appears from the expressions of our English contemporaries. Thus the *Yachting World* says: "Probably the last thing that entered the mind of any of the many sportsmen on both sides of the Atlantic who had already an interest in the coming event was the possibility of the New York Yacht Club developing a stiffness of neck such as would induce them to search the old deed for such provisions as might make it impossible for a challenger to reopen the contest. For there need be no mistake about it—that this is what the decision amounts to." The *Yachtsman* declares roundly that "the refusal of the New York Yacht Club to accept Sir Thomas Lipton's latest challenge for the America's Cup came as a great surprise to British yachtsmen, and to a very large proportion of American yachting men also. . . . As the matter stands at present the decision of the New York Yacht Club secures the cup as effectually as if it were withdrawn from competition. The grounds of refusal are rather illogical. . ." It then pronounces the new deed of gift "of no legal value whatsoever." This is hardly pleasant reading for the New York Yacht Club.

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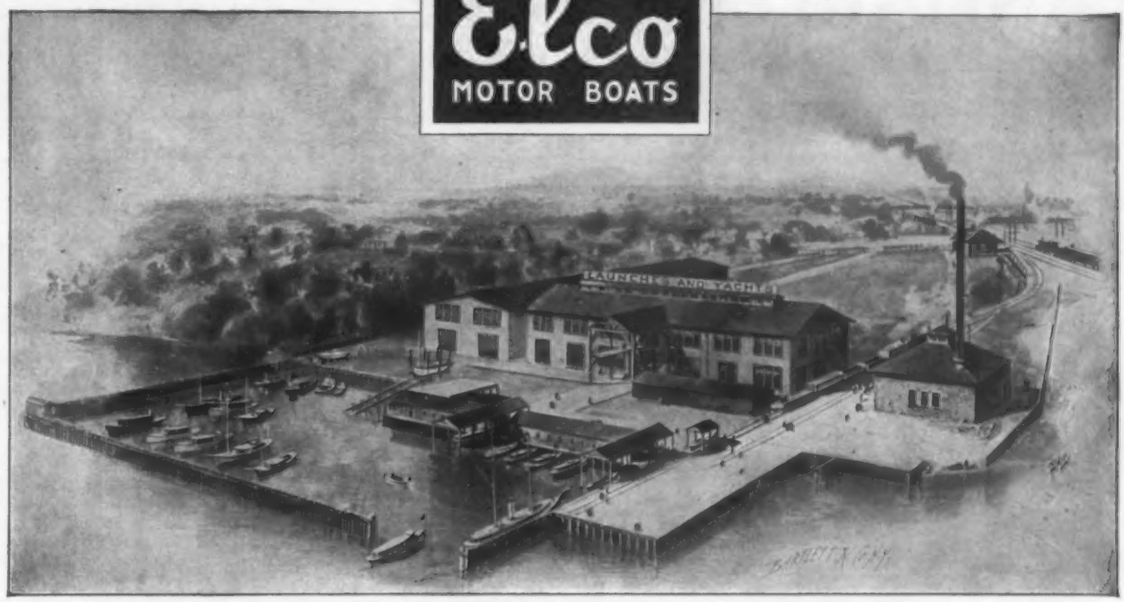

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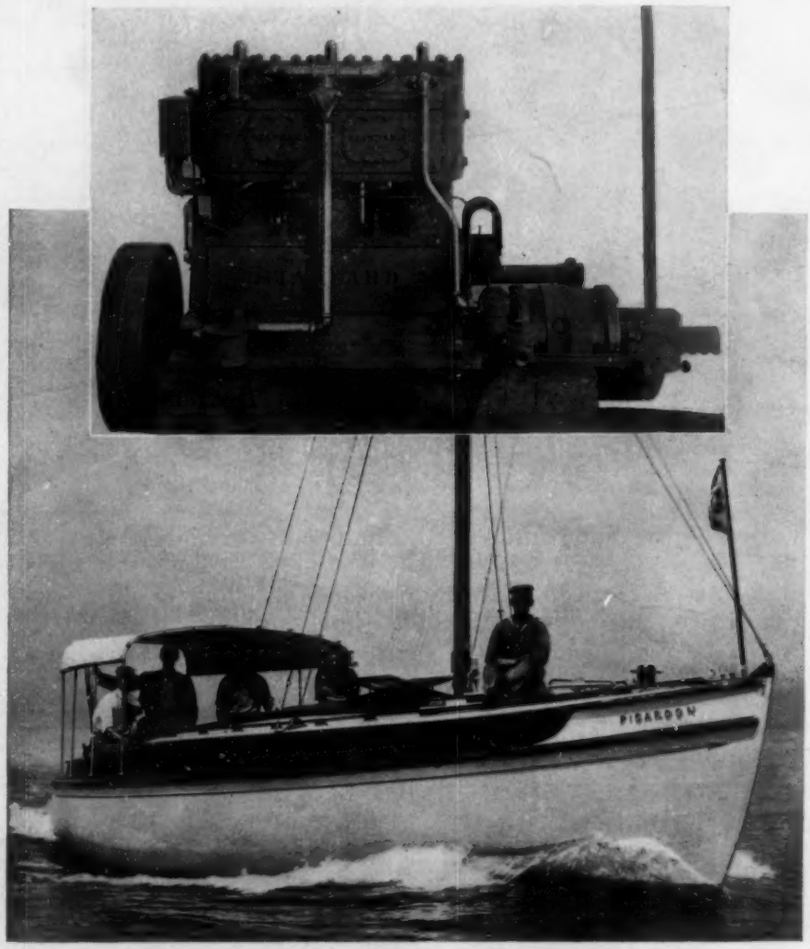

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Gasolene Queries

Under this head we are glad to answer inquiries of general interest, without publishing names or addresses of correspondents. All our readers are free to avail themselves of this privilege, and our columns are open for discussion, so long as personalities are not indulged in, and the subject matter is pertinent and in the interest of the motor boat or yacht owner. Address all correspondence to Motor Boat Editor, YACHTING, 20 Vesey Street, New York

Motor Boat Editor, YACHTING:—I have a one and a half horsepower gasolene engine in my launch. It is a two-cycle engine and I want to put on a muffler to reduce the sound of the exhaust. What I would like to find out is whether or not by doing this, I would work a hardship on the motor and reduce the speed of the boat. S. M.

Putting on a muffler will reduce the speed of the motor to some extent, but if a good one is applied the reduction will be so slight as to be of no consequence when the freedom from noise is considered. There is a great deal of difference in mufflers, some causing a great deal of back pressure and others very little, so it will be necessary to choose carefully. Avoid using too small a muffler. An automobile muffler would be very much larger than your engine would require, and would not be suitable at all.

Instituting Gasolene for Steam

Motor Boat Editor, YACHTING:—I own a small steam launch, open, which is a pretty old boat but still sound, and think some of taking out the engine and boiler and putting in a gas engine outfit. I can do the work myself, I think, but would like to know if there are any special points to be watched or any special reason why the change would not be an advantage. Can the gas engine be put in the place of the steam engine and coupled up to the old shaft and propeller? G. P. Y.

There is apparently no reason why the change cannot be made with entire satisfaction, provided a good reliable motor is installed. The lightening of the boat may perhaps affect her draught somewhat, but this will, of course, depend entirely on the difference in the weights of the old and the new power plants. If the difference is great, the propeller may be brought to the surface. Generally speaking, there is no reason why the gasolene engine should not be coupled up to the old shaft. Whether the old propeller can be used or not will depend entirely on the power and R. P. M. rate of the gasolene engine. The concern you buy the motor from can tell you what wheel will be best if you give them detailed information concerning the boat. In putting in the gasolene motor be sure to make a good solid bed, running the bed logs well fore and aft and notching them over the frames. Fit them carefully so there will be no springing when they are bolted down hard.

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The first annual Buffalo Power Boat and Sportsmen's Show will be held at Convention Hall, Buffalo, N. Y., during the week of February 3d to 8th, 1908, under the auspices of the Buffalo Launch Club, Dai H. Lewis, Manager, 760 Main Street, Buffalo, N. Y.

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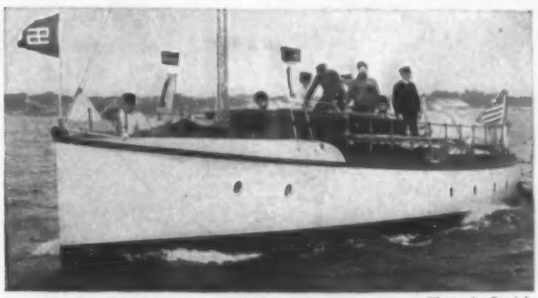

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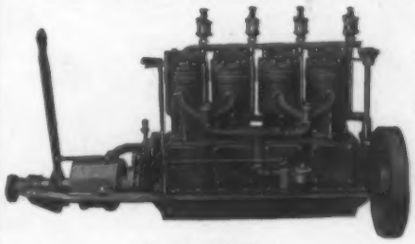

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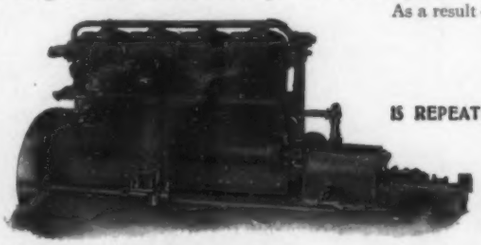

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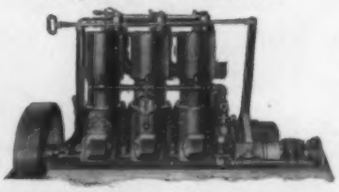

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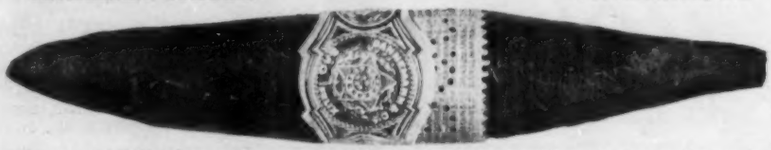

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RÉSUMÉ OF SEPTEMBER RACES

(Continued from page 272.)

EASTERN YACHTING

AFTERNOON RACE—BURTON CUP.

	Finish. h.	m.	s.
Tomahawk	4	16	14
Crusader	4	36	07
Buccaneer	4	36	31
Minnetonka	4	36	35
Pathfinder	4	35	14
Rambler	4	36	55

WALLOON LAKE MICH., LAUNCH RACES.

Class C—Horace, run by Hoshour, start 2.35, finish 3.06, time 31 minutes; Etta, Noel, 2.34 ½, 3.06 ½, 32 minutes; Marion, Estep, 2.30, 3.08, 38 minutes; Addie, Ricdon, 2.33, 3.08 ¼, 35 ½ minutes, and Susana, Jowes, 2.34, 3.09, 35 minutes.

Class B—handicap launches—St. Louis, Eastman, 3.15 ½ 3.42 ½, time 27 minutes; Warreene, Merrill, 3.21 ½, 3.43 ¼, 22 ¾ minutes; Beatrice, Koeppen, 3.16.40, 3.44.44, 28 minutes; Bixby, Bixby, 3.21, 3.43.30, 22 minutes and 30 seconds, and Lizzy, Beck, 3.23.30, 3.46.30, 23 minutes.

OHIO RIVER LAUNCH CLUB RACES.

CABIN LAUNCH CLASS.

	Time. h.	m.	s.
Monroe	0	48	28
Laura	0	40	45

CLASS B—OPEN LAUNCHES.

Billy	1	09	05

SPEED LAUNCHES.

Francais	0	29	32

CEDAR LAKE, WIS., YACHT CLUB

CLASS A.

No.		Time. h.	m.	s.
2	Hobo	0	37	00
14	*Aderyn	1	01	20

CLASS B.

6	Beatrice	1	00	30
8	Rogue	1	02	30
1	All Mild	1	05	00
10	Yhedia	1	08	00
9	Reliance	1	08	05
3	Spray	Did not finish.		

*Ruled out after the race, account fouling north buoy.

NATIONAL MOTOR BOAT CARNIVAL ON THE HUDSON RIVER

(Continued from page 258.)

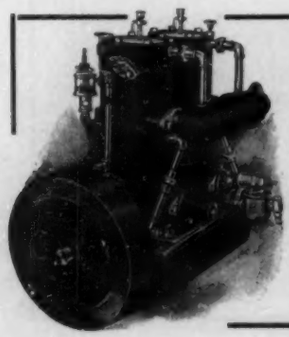
seconds apart, Den II in the lead. The difference in speed will be seen was but one-half a second a mile. Through time allowance Skedaddle won. The average time over the entire course was more than 22 knots or something over 26 miles per hour. Both boats were close together all the way and turned the stake boat at Poughkeepsie two minutes apart. Of the four other boats competing, Speedway broke down on the way up and Durno II, Sparrow and Fairbanks were left so far in the rear that they had no chance to win even with their time allowance.

A long distance race for cruising boats to Peekskill and back, a distance of 75 miles, was also run on this day. Fourteen boats started, all crossing the line.

While waiting for the finish of the long distance races, Irene tried her hand at breaking the mile speed record of the U. S. She succeeded. With the aid of a favorable tide she told off a mile at the rate of 25.904 knots or 29.828 miles per hour, beating Standard's record of last year of 29.172 miles and Den's best on Friday for the mile championship of 28.989 miles per hour.

It has been said that there is no sport in motor boat racing; that it lacks the excitement and thrill of the contest where personal effort and ingenuity count. Such a statement never came from anyone who had witnessed a contest between such flying fish as Skedaddle and Xpdnc. As they dashed over the course, covered with flying spray, engines vibrant with motion, to the click and rattle and pant of the engines, the boats throbbed with life and action and seemed like living things. The illusion was furthered by the tenseness of the crew who bent feverishly to the task of annihilating distance.

Let us suppose we were on the outer stake boat on Friday afternoon, the deciding day of the national championship. Xpdnc and Skedaddle have both won a leg on their respective trophies. It gets to be starting time. We



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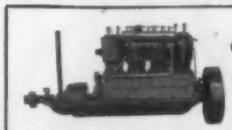

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wait, speculating on the probable winner and amusing ourselves watching the revenue cutter whistling impatiently at river craft which have the temerity to venture on the course, or warning others that they must not take the middle of the river. Suddenly away in the distance we see two dark specks surrounded by foam. They seem a long distance away and we expect to wait for some time, but they grow rapidly in proportion and before we realize it they are nearly abreast of us.

Xpdnc with her stern apparently completely immersed, resembling some fabled monster coming from the depths is hotly pursued by the giant Skedaddle. You shiver for the smaller craft but do not remember that here is the turn. Xpdnc steers almost straight for the mark, dashes around it and is off. Skedaddle, by reason of her length, sweeps around in a wide circle, rushing through the water, pushing, tearing her way like a thing possessed, but as she turns, encounters a wall of water on the leeward side.

The crew with grim resolution written on their faces lean far out over the rail to shift the center of gravity and unconsciously stretch forward as if to accelerate the speed, but she will not take the turn quickly. Her engines are slowed and gradually she comes about, impatiently enough. This is the penalty of length and brute build. When the straight away is again reached Xpdnc has made good her escape, but she knows there is a long stretch before the next turn and Skedaddle is in hot pursuit. No greater contrast can be imagined than between these flyers of the sea and the staid and dignified cruising yachts.

Taking it as a whole the motor boat regatta was a successful meet in the interest aroused, number of entrants and results achieved. As a spectacular event, however, speaking from the attendance and enthusiasm of spectators, it was a most disappointing affair. Here in the very heart of the greatest metropolis in the country, the course along Riverside Drive from which could be witnessed with birds-eye accuracy and comprehensiveness the entire contest, no crowds were there to cheer on the contestants, no puffing tugs or gaily decked excursion boats lined the course.

A few club members and their friends at the clubhouse opposite the finish line, a lonely stake boat and a business-like revenue cutter at the turn was the only fleet that did honor to the event. Perhaps the weather had something to do with it for it was for the most part unpropitious—perhaps. But in my opinion, this was not the cause. The fault was with the season. It was too late. Cold September weather had robbed boating of its interest and enthusiasm was stowed away for the winter. The most important regatta of the year held at the tail end of the summer! Interest can never be gained by such an arrangement. What is necessary is the same sort of arrangement that characterizes our wind jamming contests. Frequent regattas should be held throughout the season. This would not only arouse greater interest in the sport through the continuity of events, but the season would be more auspicious, and it would be a fairer way to decide championship.

Obviously, in motor boat racing, championships should not be decided on the results of a single week. It is different with sailing craft for with them no internal trouble is likely to occur. In the other, an engine breaks down, some floating debris in the water puts a propeller out of running and the chances of that contestant are gone. A case in point is the Dixie. This invincible winner of the International Cup through the mishap of a cracked cylinder forfeits her entire chances of winning the international trophy, whereas had this been only one leg of a

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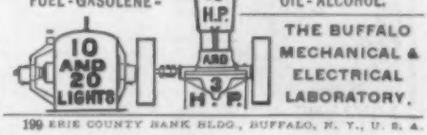

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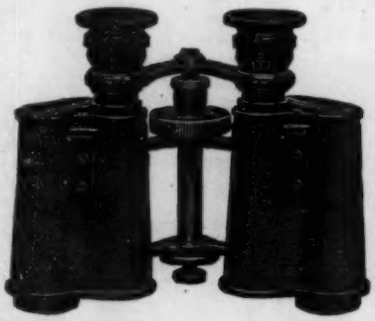

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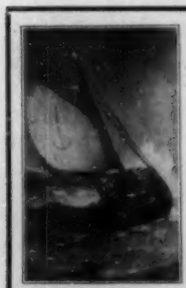

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series, the handicap could have been offset by a similar misfortune on the part of other competing craft, or through good work in the other events she would have had the opportunity of creeping up on her rivals

The Motor Boat Club has come to recognize the truth of this and is planning to hold its regatta in the first week of August of next year with successive events during the remainder of the summer. This regatta, by the way, will not be held on the Hudson River as formerly. This course, while very convenient is unsatisfactory on account of the quantity of drift which is encountered in those waters. The place selected is Huntington Harbor on the north shore of Long Island, where the Motor Boat Club of America has recently established a station, and the time set is coincident with the cruise of the New York Yacht Club, the first night's anchorage of which was there this summer, and it is expected that this port will remain in the Club's itinerary. It is planned to run then, during the visit of the New York Yacht Club squadron, the races for the Harmsworth Cup which the peerless Dixie brought to this country a few months ago. This international contest will give a stimulus to motor boat racing which it has never had and give to the sport a recognition that should benefit it to a very marked degree. Then motor boat racing will, in a measure acquire a recognition in the public mind that other events in the world of sport have obtained. Moreover, now that the America's Cup will not be contested for in 1908, attention will be focused on this international trophy for motor boats. Already five or six members of the Motor Boat Club of America have announced their intention of building high powered boats to compete for the honor of defending the cup. With the fine balance which has finally been struck in the racing rule for speed boats and these Harmsworth races, together with a revision of the regatta plans by the Motor Boat Club of America so that events may be run throughout the summer, the season of 1908 will mark a new epoch in motor boat racing.

The Reliability Trials had not been decided on going to press but it is believed Speedway belonging to Charles L. Seabury won. The following entries were made for these trials.

Name. Owner.	L.O.A.	H.P.
Durno II, J. H. Durno	25.6	15.15
Mao II, Dr. Oppenheimer	70.0	60.00
Myosotis, W. Ferguson, Jr.	40.0	22.85
Sparrow, C. J. Swain		29.15
Kalaco, Thos. W. Purdy	38.0	.....
Speedway, Chas. L. Seabury	45.0	99.54
Idler, J. J. Amory	39.00	17.70
Speedway, Jr., C. L. Seabury	30.10½	13.25

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Name. Owner.	L.O.A.	H.P.	Elapsed Time.
Skedaddle, H. N. Baruch	60.0	190	1 39 23
Irene, J. F. Anderson	39.4	200	Did not finish
Den II, J. H. Hoadley	31.9	74	Did not finish
Dixie, E. J. Schroeder	39.9	150	Did not finish

INTERNATIONAL WORLD CHAMPIONSHIP—COURSE, 30 NAUTICAL MILES.

Elapsed Time.

	1st Day.	2d Day.	3d Day.
Den II	1 15 52	. . . .	1 19 47
Dixie	Broke down	Broke down	. . . .
Irene	Broke down	1 15 07	1 15 56

Corrected Time.

	1st Day.	2d Day.	3d Day.
Den II	1 15 52	. . . .	1 19 47
Dixie	Broke down	Broke down	. . . .
Irene	Broke down	1 15 07	1 15 56

NATIONAL CHAMPIONSHIP—COURSE, 30 MILES.

Name. Owner.	L.O.A.	H.P.
Xpdnc, Jacob Siegel	43.3	60
Skedaddle, H. N. Baruch	60.0	190
Speedway, C. L. Seabury	45.0	99.54

Elapsed Time.

Name.	1st Day.	2d Day.	3d Day.
Xpdnc	1 20 01	1 20 23	1 19 57
Skedaddle	1 31 03	1 23 10	1 19 53
Speedway	1 33 18	Broke down	

Corrected Time.

Xpdnc	1 20 01	1 20 23	1 19 57
Skedaddle	1 24 32	1 16 49	1 13 32
Speedway	1 26 47	Broke down	

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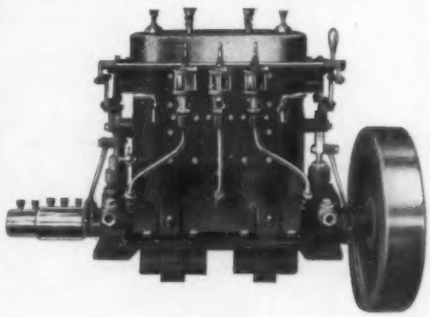

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INTERSTATE CHAMPIONSHIP—COURSE, 30 MILES.

Name. Owner.	L.O.A.	H.P.
Sparrow, C. J. Swain	....	39.15
Meteor, B. J. Gibbon	31	36.00
Durno II, J. H. Durno	25.6	15.15
Artful, C. Coones	....	.....

Elapsed Time

Name.	1st Day.	2d Day.	3d Day.
Sparrow	1 40 53	1 32 53	1 35 42
Meteor	1 47 11	1 48 42	. . . .
Durno II	2 26 31	. . . .	. . . .
Artful	. . . .	2 19 11	2 15 53

Corrected Time

Name.	1st Day.	2d Day.	3d Day.
Sparrow	1 43 39	1 26 39	1 35 42
Meteor	1 47 11	1 48 42	. . . .
Durno II	2 00 06	. . . .	. . . .
Artful	. . . .	1 46 21	1 49 17

The motor Yacht Championship series race had not been decided on going to press, but it is believed E. J. Steiner's Wanderlust has won the event.

The entries were as follows:

Name. Owner.	L.O.A.	H.P.
Wanderlust, E. J. Steiner	68	50
Mao II, Dr. Oppenheimer	70	60
Marie, Dr. L. Newman	65	40
Alabama, J. H. Hoadley	71	80

One Mile Championship. Flying Start. Three times with and three times against tide.

Name.	1st Trial. With. m. s.	1st Trial. Ag'st. m. s.	2d Trial. With. m. s.	2d Trial. Ag'st. m. s.	3d Trial. With. m. s.	3d Trial. Ag'st. m. s.
Den II	2 15	2 32	2 16	2 34	2 21	2 34
Skedaddle	2 24	2 50	2 24	2 46	2 14	2 44

CABIN LAUNCH CHAMPIONSHIP—COURSE, 20 MILES.

Name. Owner.	L.O.A.	H.P.
Ailsa Craig, J. Craig	59	60
Iris, H. Chegnoy	45	24
Beldame, W. P. Foss	53	55

Elapsed Time

Name.	1st Day.	2d Day.	3d Day.
Ailsa Craig	1 56 13	2 13 14	1 51 34
Iris	2 49 28	. . . .	. . . .
Beldame	. . . .	1 46 16	1 49 05

CLASS L—COURSE, 20 MILES.

Name. Owner.	L.O.A.	H.P.
Idler, J. J. Amory	39.0	17.7
Ralaco, T. W. Purdie	38.0	....
Kittu, F. D. Green	33.3½	....
The Rose, G. Ludwig	34.0	....
Aquila, R. C. Annett	40.0	30.0
Juliet, P. Deering	30.0	....
Speedway, Jr., C. L. Seabury	30.0	....

Elapsed Time

Name.	1st Day.	2d Day.	3d Day.
Idler	2 34 43	2 25 48	2 20 56
Ralaco	2 41 21	2 33 11	2 31 07
Kittu	2 53 50	2 37 45	2 37 06
The Rose	3 08 37	2 55 41	2 47 14
Aquila	. . . .	2 16 04	. . . .
Juliet	3 05 23	2 38 05	2 34 18
Speedway, Jr.	2 18 28	2 03 25	2 35 06

Corrected Time

Name.	1st Day.	2d Day.	3d Day.
Idler	2 05 10	1 57 35	1 52 23
Ralaco	2 15 45	2 07 35	2 05 31
Kittu	2 28 57	2 12 52	2 12 13
The Rose	2 41 55	2 28 59	2 20 22
Aquila	. . . .	1 59 16	. . . .
Juliet	3 00 15	2 32 57	2 29 10
Speedway, Jr.	2 18 28	2 03 25	2 03 56

Total points for three days: Kittu, 11; Juliet, 6; Ralaco, 15; The Rose, 7; Idler, 21; Speedway, Jr., 16.

THE FLOATING LIGHTHOUSES

(Continued from page 265.)

lights on the vessel. There is to be another attempt shortly, on an entirely new plan. Whether it will succeed, only the future can show, but capable engineers, guided by the experience of the past, have said that it will,—and if it does—well, that is altogether another story—but if it does, America will have the finest lighthouse in the world.

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Next time you pass a lightship in your trim yacht with its shining brass and its glittering sails, get up from your comfortable deck chair and dip your colors to the staunch, ugly, brave little boat that stands up to any weather that comes, to guide you to a safe harbor. Fire a salute, if you have a bit of gun, for the men who are not afraid of any storm that blows, and be not ashamed to take off your cap to the floating house of everyday heroism, which is what it is and where it is, because of the good courage and stout hearts that have but one end and aim in life—to keep the lamps lighted.

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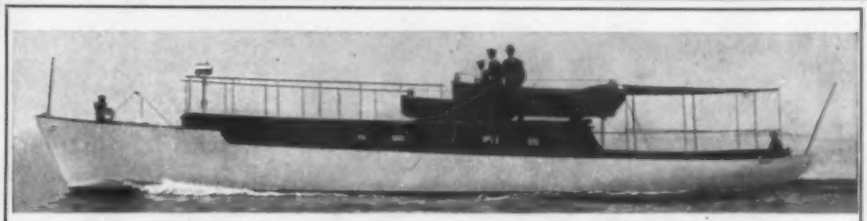

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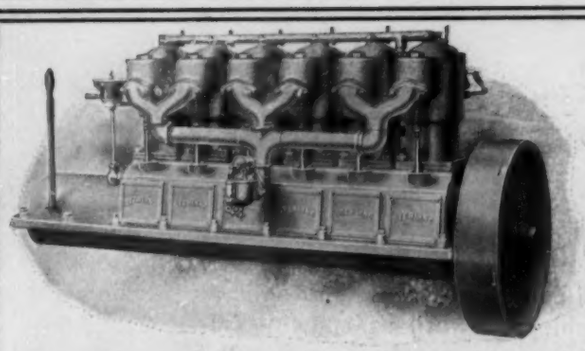

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PRACTICAL STORY OF THE GASOLENE MOTOR.

(Continued from page 280.)

this plan, with good results, but are not, as yet, much in evidence.

There is one kind of vibration caused by motors that cannot be counteracted by any simple means, and is quite independent of the mechanical balance of the engine. This is what is known as "torque reaction." When the engine is running it has to push against the resistance of the water to the propeller, and this causes the cylinders, and anything to which the cylinders are rigidly secured—the crankcase and the boat itself—to be given an impulse in the direction opposite to the rotation of the crankshaft. If you take hold of the crank of a grindstone that turns for some reason very hard, and suddenly exert your strength to turn it, there will be a reaction which will tend to move your body in the opposite direction. An engine thoroughly well balanced may cause vibration in a boat simply because the reaction from each impulse is felt. It logically follows that the smoother and less jerky the turning effort on the crankshaft—or, technically, the more nearly constant the torque—the less vibration will be caused by reaction. This is one, though not the only reason why multiple cylinders are so generally used.

A number of engines have been carried to a point where no fly-wheel is required. Among these is a six-cylinder machine, working on the four-cycle principle but being double-acting, having combustion chambers at both ends of the cylinders, the piston rods passing out through stuffing-boxes, as in steam engines, and having crossheads and guides, instead of the ordinary gas-engine arrangement of trunk pistons and direct connecting rods. Each cylinder produces two explosions in succession—say, one on the down-stroke and one on the succeeding up-stroke—and the next two strokes, down and up, are idle. Thus there are two explosions and two idle strokes in two revolutions, or a mean of one explosion for each revolution, the same number as in a two-cycle cylinder but differently distributed. With a single cylinder this would be rather a jerky arrangement, but with several cylinders the explosions are timed at proper intervals so that the impulses of one cylinder occur during the idle strokes of the other. With a six-cylinder motor of this kind there will be six impulses with each revolution, or one impulse with every sixth of a revolution or 60 degrees. Thus there are always at least two charges expanding and driving their pistons, and most of the time there are three working together.

A motor of very recent development, designed with a view to obtaining a maximum degree of torque constancy is of the two-cycle type, double acting, having cylinders with combustion chambers at each end a single piston which receives an impulse first on one side and then on the other. There is no crankcase for an eccentric offset of the cylinder and piston serves as a pumping chamber and a rod from this part of the piston extends upward and out through a stuffing box, carrying a crosshead to which the connecting rod is journalled. In a motor of this type there are two impulses with each revolution of the shaft from each cylinder, exactly as in a double-acting steam engine; one cylinder produces the same number of impulses per revolution of the shaft or two two-cycle cylinders or four four-cycle cylinders. With two cylinders no fly-wheel is necessary. In principle, each consists of two cylinders of the two-cycle opposed, with a common piston. This arrangement gives the greatest possible number of impulses, as every stroke is a power stroke and none is idle.

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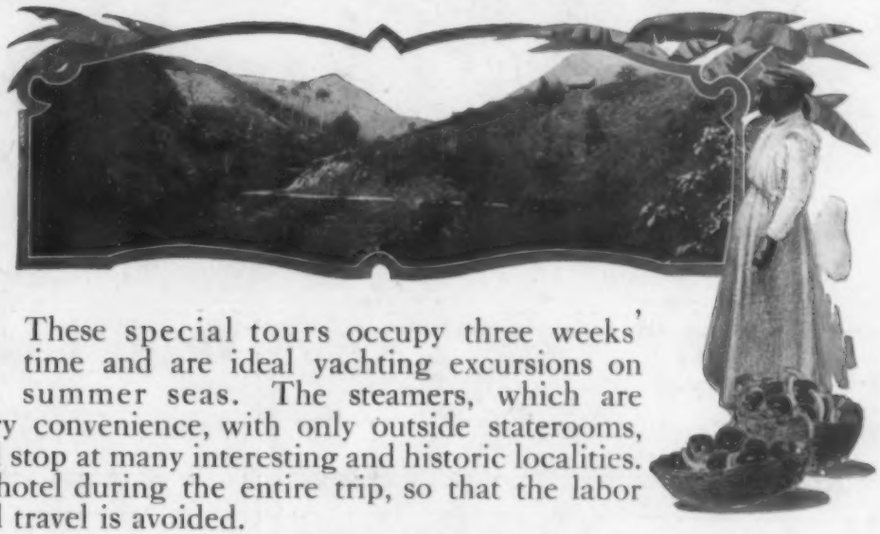

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Continued from page 249.

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FOR SALE No. 10157 SLOOP "JOY," 38.4 o.a., 25.4 w.l., 8 beam, 6 draught, designed by C. D. Mower, built 1906 by Geo. Lawley & Son. Double planked, and fastened with copper and bronze. Two tons lead on keel. Has 3 suits of sail, one by Ratsey & Lapthorn, besides binnacle and compass, anchor and cable, etc. Winner of Larchmont series 1906, and out of 43 series that year won 21 firsts, 8 seconds, 6 thirds. In 1907 she won 7 firsts, 7 seconds, 7 thirds out of 30 races, becoming champion Class "Q" Gravesend Bay. Inspectable near New York. For further particulars, apply to STANLEY M. SEAMAN, 220 Broadway, New York.

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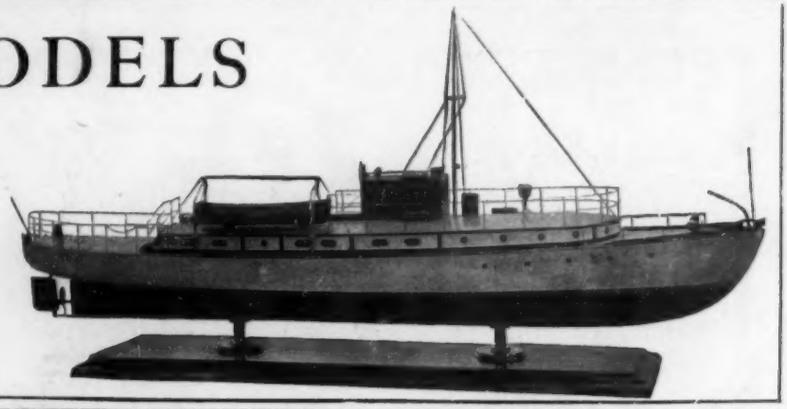

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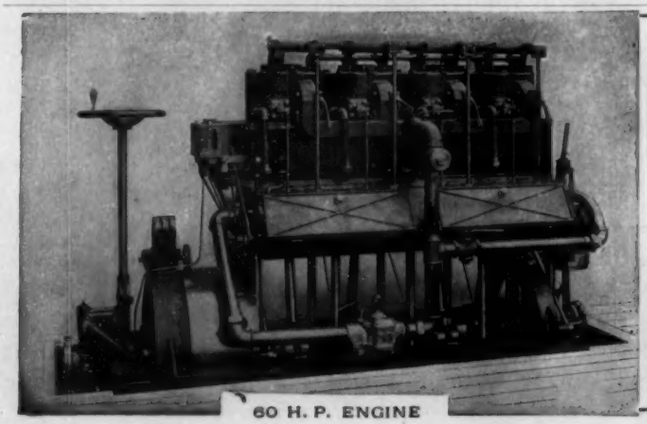

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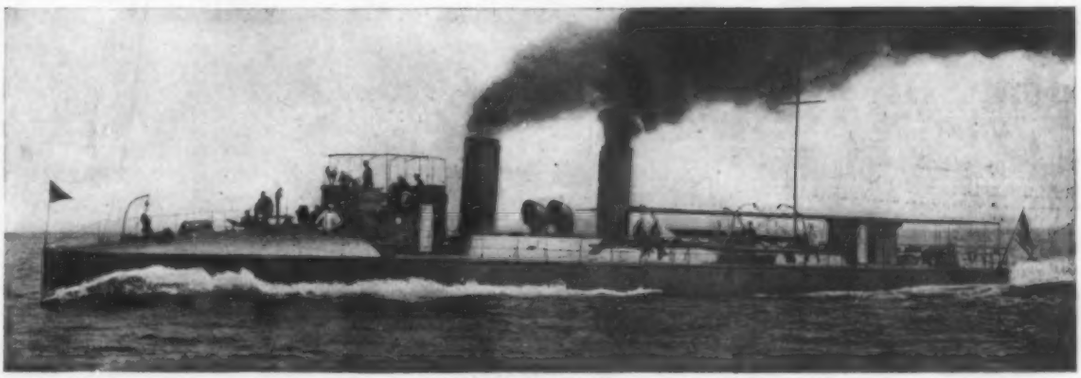

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